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EDITED BY
S. C. MITRA

with the assistance of
RABI GHOSH

IN COLLABORATION WITH

(Miss) K. H. Cama Bombay	K. C. Mukherji Dacca	M. Aslam Lahore
Rangin C. Haldar Patna	Kali Prasad Lucknow	Parsram Lahore
N. P. Mukherji Calcutta	K. L. Shrinani Udaipur	P. S. Naidu Allahabad
T. K. N. Menon Baroda	P. T. Raju Waltair	S. R. Bose Calcutta
H. W. Franklin Jubhalpore	R. M. Loomba Delhi	M. Mukhdum Aligarh

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of a unit is regarded as quantitative. The length of an object is a measurable magnitude, it can be measured in terms of units, *riz.*, centimetres. The total magnitude is regarded as a multiple or submultiple of the unit. The weight of butter is a quantity, it is measured in terms of the unit gram. We are all familiar with physical magnitudes, their measurements and their units. But are there psychological magnitudes which can be measured? And if so, what are the units of measurement?

Fechner's Concept of Measurement of Sensation : It was G. T. Fechner who first maintained that psychical phenomenon of sensation-intensity might be regarded as the sum of a number of small sensation-units exactly in the way an hour is taken to be composed of seconds. The unit chosen was the Just Noticeable Difference of Sensation (j.n.d.). Fechner assumed that the just noticeable differences at different levels of intensity of a particular sensation are all equal and hence are suitable units for measuring sensation-intensities. Supposing a sensation-intensity S_2 is found to be just noticeably stronger than the sensation-intensity S_1 , then S_2 may be regarded as equal to $S_1 + 1$ j.n.d. Similarly when S_3 is found just observably greater than S_2 it may be taken as equal to $S_2 + 1$ j.n.d. and so on.

The concept of just noticeable difference of sensation as a unit did not, however, actually originate with Fechner. He got the cue from Weber's experimental results.

E. H. Weber, professor of anatomy in the University of Leipzig, conducted a long series of experiments with lifted weights from 1829-1834. His investigation consisted in determining what amount of weight could be added to a standard weight so that the difference between the original and the increased weight might be just noticeable. He found that for a weight of 32 drams the average just noticeable difference for four persons who had participated in his experiments was 3 drams and for a standard of 32 ounces the difference was not 3 drams but 3 ounces. In other words, the stimulus-increase for just perceptible difference was not a constant amount but was a constant portion of the weight lifted, *i.e.*, $dR/R = c$, where dR is the stimulus-increase for just

noticeable difference, R is the stimulus or the standard, and c is a constant to be determined experimentally.

Weber also obtained similar results in the field of visual distances. A line of 101 mm. could be just distinguished as longer than one of 100 mm., while a line of 50.5 mm. was judged to be just noticeable longer than one of 50 mm.

On the basis of these results Weber formulated a general relation which may be thus expressed: In comparing one object with another we perceive not the actual difference between the two objects but the ratio of this difference to the magnitude of the standard that is being compared.

Fechner with his mathematical mind discovered the rudiment of units of mental measurement in Weber's findings. Accepting Weber's equation $dR/R=c$ as fundamentally correct, Fechner transformed the former's experimental discovery of relation into a general form and interpreted it as a functional relation between the body and the mind. How he did that will be made clear by an example.

If a 110 gram-weight is found experimentally to be just heavier than a 100 gram-weight, then, according to Weber's relation, 121 gram-weight will be just noticeably heavier than 110 gram-weight and 133.1 gram-weight will be just heavier in comparison with 121 gram-weight and so on. Fechner assumed that the sensation S_2 corresponding to 110 gram-weight was just perceptibly greater than the sensation S_1 corresponding to the 100 gram-weight and the sensation S_3 corresponding to the 121 gram-weight was just greater than the sensation S_2 ; similarly, the sensation S_4 corresponding to the 133.1 gram-weight was just noticeably greater than the sensation S_3 and so on with regard to other sensations corresponding to different weights.

Fechner considered S_2 as greater than S_1 by one just noticeable difference in sensation (1 j.n.d.), S_3 as greater than S_2 by one just noticeable difference, and so on. Furthermore, he thought S_2 as equivalent to $S_1 + 1$ j.n.d. and $S_3 = S_2 + 1$ j.n.d. $= S_1 + 2$ j.n.d's. Behind such statements was the assumption that all j.n.d's at all levels of intensity are equal in sensation value.

A weight of 100 grams when placed on the pan of a balance causes deflection of the needle, say, to 10 scale marks. On adding

10 grams to the original weight let us suppose that the needle is further deflected by one mark and we find the total deflection to be 11 marks. If 10 grams more weight are added, the needle moves away over another scale mark. Taking this as an analogy we may say that, according to Fechner's conception, when a 100 gram-weight is placed on the palm of the hand the mental balance records a sensation S_1 . On placing 10 grams more the mental balance records one j.n.d. over and above the sensation S_1 . Unlike, however, the physical balance of our example, the mental balance on the second occasion would not record one j.n.d. until 11 grams more have been added to 110 grams. For recording the next j.n.d. at the third time the mental balance would require an addition of 12.1 grams. Fechner concluded that when the stimulus increases from 100 to 110 grams, then to 121 grams, and then to 133.1 grams, *i.e.*, each time by one-tenth of the standard or, in other words, by equal ratios or in geometrical progression, the sensation increases by equal steps of one j.n.d. unit, *i.e.*, in arithmetical progression.

This conclusion Fechner expressed in the well-known mathematical form which is usually put as $S = c \log R$, where S is the sensation, R the stimulus and c a constant determined experimentally.

Later Conception of Measurement of Sensation-Distance : Fechner's conception that sensation-intensity is a multitude of small units of intensities was very adversely criticized by many later psychologists and it had to be ultimately given up. In the opinion of the critics sensation-intensity is not a multitude and it is not divisible; every sensation is qualitatively different from every other sensation. What we usually consider to be an intensity difference is really a qualitative difference. Fechner's conception of j.n.d. was also subjected to severe criticism. The just noticeable difference in sensation is supposed to have been a datum of direct observation by Fechner but other psychologists¹ especially those who worked with sensation-intensity failed to detect the j.n.d. as such in their introspection. One sensation may be perceived as different from another but no sensation can be psychologically said to be *just* noticeably different from another. 'No sensation wears upon

its face a *just* noticeable difference.' Just noticeable difference is not, as it seems at first, a matter of direct observation, it is a difference or an assumption. It is therefore a theoretical or an abstract concept.

Moreover Fechner's idea of the equality of the j.n.d. at different levels of intensity led to a tremendous controversy. Several experimental investigations have been made with the expressed purpose of testing the equality of the j.n.d's. A series of stimuli values corresponding to eight successive j.n.d's of sensations are determined and then the total 'sensation-distance' is divided into two halves so that each half consists of the distances covered by four successive j.n.d's. These two halves are then compared. If the sensation-distances corresponding to the two halves are found to be equal in introspective experience, the j.n.d's may be regarded as equal.

Experiments conducted by Angell and Ebbinghaus confirmed the equalities of the j.n.d's but other investigators obtained conflicting results. At the present moment we are not certain if the j.n.d's are equal. The question remains an open one.

Measurement of sensation-intensity, notwithstanding the difficulties mentioned here, is not, however, entirely impossible. Given different sensation-intensities, S_1 , S_2 , S_3 , etc., it is possible to grade them according to their intensity values. Moreover according to some observers, given two sensation-intensities, S_1 and S_2 , it is quite possible to find another S_3 so that S_3 appears to be as much more intense than S_2 as S_2 appears in comparison with S_1 . The disparity between S_2 and S_3 can be directly compared with the disparity between S_1 and S_2 . This degree of unlikeness can be represented in other parts of the intensive scale and may be regarded as the unit of measurement in place of the j.n.d. These units are, as a matter of fact, data of direct observation whereas the units of j.n.d. are not so directly apprehended.

This view of mental measurement in terms of sense-apartness or sense-disparity first originated with J. R. L. Delboeuf (1878) and it was Ebbinghaus who first made experiments with light intensities using 'equal appearing sense-distance' as the unit of measurement. This view has been supported by Wundt, Stumpf, James, Müller, and others, some of whom happened to have been bitter critics of Fechner's conception. But here again we are not

sure whether the 'equal appearing intervals' at different parts of the intensive scale are really equal or not, or whether a given sense-distance can be equated as a multiple of a unit sense-disparity.

After a long and extremely acute discussion, in which the fundamental logic of measurement of physical magnitude was analyzed and compared with that of psychological measurement, it has been now generally agreed by the majority of the psychologists² that sensation-intensities and their differences are at least 'magnitudes' that can be graded. Careful grading of a large number of intensities as also of their differences may ultimately lead to their spacing out in such a way as almost to correspond to their true positions in the scale of intensities.

Measurement of Thresholds : We have definitely rejected at the present time Fechner's idea of considering a large sensation as the sum of smaller sensations. With the rejection of that concept has also been discarded his generalized law based on that idea. But Fechner's contribution to psychological measurement is not limited to his conception of unit sensations nor to the formulation of the Weber-Fechner Law. His monumental work on the experimental determination of the value of threshold still stands out as a landmark in the progress of our science. These values by themselves are regarded as indirect measures of 'sensitivity' and 'sensible discrimination' of observers. Further, the method and the technique which he conceived, developed and established have been of great value in quantitative psychology. He was the first to introduce the systematic methods of mental measurement and these methods are still being utilized in all quantitative studies of psychology.

Moreover Fechner's work changed completely the outlook of the psychologists. Up to his time psychology was not regarded even as an experimental science. In view of Kant's declaration that psychology could never attain the rank of a true science there were prejudices, doubts, and controversies regarding the adoption of scientific methods in the study of psychology. Fechner's work and his methodology have not only broken the prejudice but have raised psychology, once and for all, to the dignity of a quantitative

science. He showed conclusively that the problems of psychology can be subjected to quantitative methods and are amenable to mathematical treatment. Since the publication of Fechner's 'Elemente der Psychophysik' in 1860 there has been a very rapid growth of quantitative work in psychology. In the later part of the nineteenth century innumerable studies on 'threshold values' in all sense departments were made and even to this day we find that interest in this kind of study continues.

Experimental determination of the 'threshold value' is an extremely difficult and complicated task. The value of threshold as you know, can be best found out by what is known as the Constant Method. It rests on the number of relative frequencies of different judgments obtained by comparing different variable stimuli with a standard stimulus. There are various possible sources of errors which deflect the subject's judgment. Expectation, habituation, practice, fatigue, interest, attention, understanding of the problem, attitude of the subject towards the experiment and external disturbances are some of the chief factors effecting the judgment of observers. These disturbing causes are known as variable factors and their influence varies from time to time as the experiment proceeds. Judgment will vary according to the amount of practice, the degree of understanding of the problem, the interest taken in the experiment and so on.

If observations are made under similar conditions of practice, fatigue, attention, etc., and under similar physical situations, the judgments should be expected to be constant theoretically but, as a matter of fact, it has been found that judgments do vary from observation to observation. This can only mean that in spite of the best efforts of subjects there occur chance deviations in the conditions which influence the judgments. The variations in judgment thus occurring are known as 'chance errors' or 'errors of observation.' The same stimulus in comparison with a given standard may be judged as 'equal' at one time and 'greater' at the next moment. But in a sufficiently large number of observations such variations in judgment are found to occur not at random but to take place in a definable way which can be shown to follow definite mathematical principles. The relative proportions of frequencies of 'greater,' 'equal' and 'less' judgments vary as

the differences between the standard and the comparison stimuli vary. The variations obey the law of distribution of normal curve.

When the observed data satisfy the law of normal distribution they are called homogeneous. In order to be homogeneous the data must satisfy two conditions : (1) Experiments should be conducted under similar psychophysical conditions, and (2) the number of experiments should be fairly large. Small number of data even when collected under similar conditions of experimentation may not be homogeneous and, again, a large number of data when obtained under similar conditions are not necessarily homogeneous. As the homogeneity of data is very rare in psychophysical experiments doubts have been expressed by some investigators³ regarding the validity of normal distribution of the reports of judgment. In cases of lifted weights and temperature discriminations Cullen⁴ has shown that about 80 per cent. of the whole number of distribution followed the law. The data I have obtained in my psychophysical experiments⁵, numbering about 10,000, showed normal distribution. It can be safely asserted that a long series of data when collected under similar psychophysical conditions satisfies the ' Normal ' law. When the distribution of judgment does not follow the ' Normal ' law it may be inferred that some variable factors are still at work. The data in such cases should not be regarded as reliable.

The data, however, do not mean much till the values of threshold and the amount of chance errors are calculated from them. The values are determined by appropriate applications of refined mathematical formulae. The technique and the process of computing values are very lengthy and laborious. Many shorter methods have been suggested. It is no doubt sensible to use simple formulae for treating a small number of data of doubtful reliability but it is not proper, as Urban⁶ has emphasized, ' to treat results of short and long series of experiments in the same way. The energy spent in collecting the vast number of data is wasted if we do not get as much out of these as there is in them.' On the other hand, when the data are not homogeneous and when they are small in number, the application of refined and laborious calculations is a mere wastage of energy.

Discrepancies of Weber's Relation : Weber found in a series of experiments with lifted weights that dR/R was constant for different regions of the intensity scale of the stimuli.

Fechner demonstrated its constancy in many different realms of sensation-intensity. Aubert (1865) and Helmholtz (1866) challenged the validity of Weber's relation on the basis of their own experiments in the field of vision. The ratio was again the subject of investigation by König and Brodhun (1888). They showed that dR/R decreased steadily as the intensity increased up to a certain point beyond which the dR/R increased. Blanchard (1918) corroborated the findings of König and Brodhun. Lowry (1931) has recently reinvestigated the way in which dR/R varies at the middle region of the intensity scale. His results tally somewhat with those of König and Brodhun. Detailed experiments of Hecht⁷ with light intensities on *Mya*, a kind of shell-fish, indicate that dR/R for just perceptible response varies with the variation of the values of R .

We find wide discrepancies in the results of different investigators but before we compare their results and draw any conclusion from them it will be pertinent to enquire whether the values were obtained from sufficiently long series of data collected under similar conditions of experiments. First of all, we find from the records of some of the investigators that the data are not sufficiently numerous and, secondly, we notice that experiments were not all conducted under similar sets of experimental conditions. Titchener⁸, Fernberger⁹ and others thought that in many cases the subjects could not maintain their attitude constant throughout the experiment and they suggested accordingly that the discrepancies were to be explained in terms of the shift of attitude. I think that the inconsistency in the results, that we find in some of the cases mentioned above, may be due to the fact that the results were obtained from defective samples. Moreover, Weber, Fechner, Helmholtz and others varied the comparison stimulus 'step by step' by small increments until the subject could notice a change, whereas in some of the above-mentioned experiments the intensity of the stimulus was increased or decreased *continuously* until a change was noticed. This change of condition of the experiment

from step by step increase to continuous increase may be responsible for the discrepancies.

I made an extensive series of experiments with lifted weights from 1928 to 1938 under the condition of continuous increase with a view to test the validity of Weber's relation⁵. The results of my investigation were obtained from statistically tested homogeneous data. Some of my findings were found to tally substantially with those of König and Brodhuu as well as they were confirmed by results of Hecht, all of whom (as far as I could gather from their reports) used the method of continuous increase in the presentation of their stimuli. The results of König, of Hecht and of myself do not, however, contradict those of Weber, Fechner and others. I do not subscribe to the view that these results disprove the findings of Weber and others as Hecht is inclined to think. The two sets of results were obtained under different conditions. I have shown that the procedure of continuous increase induces in the observers psychophysical conditions (*e.g.*, condition of attitude, condition of attention, condition of expectation and adaptation, etc.) which are radically different from those induced by the procedure of step by step increase. My contention is that the two types of findings express measures of different capacities or of somewhat similar capacities under altogether different sets of psychophysical conditions and as such they are not directly comparable.

Measurement of Abilities : The spirit of the age is that of social service. Influenced no doubt to some extent by the prevailing spirit present-day psychologists have shifted their attention from the study of sensitivity, sensible discrimination and threshold to fields with which human welfare is more directly concerned.

Great progress has been made at the present time in the measurement of 'intelligence,' 'abilities,' 'personality traits,' 'character traits,' 'attitudes' and the like. Performances of definite types are graded and indices of the abilities or traits to be measured are calculated. The scores for the various performances are considered to be an indirect numerical measure of the mental processes involved in the performances.

It may be questioned whether such indirect measures can legitimately be regarded as measures of mental processes. In

physical sciences indirect measures are not rare. In operations like the weighing by means of a spring balance what is observed directly is the movement of a pointer from the zero mark to another definite scale mark. This scale mark is the indirect measure of the weight. But it has to be borne in mind that the relationship between the amount of movement of the pointer and the mass has been determined at some time or other by some method of direct measurement. So long this is not done the scale cannot be calibrated in terms of any unit. In indirect mental measurements the mental processes involved are not amenable to direct observation of measurement. Hence the scores which are regarded as indices do not actually measure the absolute amount of mental processes involved but they merely indicate the relative positions of the subjects tested in the scale. It is evident, therefore, that the scores of indirect mental measurements show several important points of difference from those of physical measurements. A man whose weight is indicated on the dial of a weighing machine at the 200th mark with the needle is twice as heavy as another in whose case the pointer stands at the 100th mark. But a boy whose score mounts up to 200 in arithmetic performance cannot be said to possess twice as much arithmetical ability as the one whose score stands at 100. Similarly a boy whose I.Q. is 70 cannot be said to possess half as much intelligence as another whose I.Q. is 140.

In physical units there is a starting point of zero mark from which measurements are made, but in psychological determinations it has not been possible to find a similar null point. The zero score in intelligence tests does not mean that the person tested possesses no intelligence; it simply means that the tests applied are not an adequate instrument for measuring such low degree of intelligence as the testee possesses. Furthermore, there are no direct ways of knowing whether the difference in ability as represented by scores 20 and 10 is the same as that represented by 90 and 80. It cannot be said definitely that a boy with an I.Q. of 120 is as far ahead of another with an I.Q. of 100 as the second boy is ahead of a third whose I.Q. is 80. Equal differences of scores give no assurance that there are corresponding equal differences of mental development.

This non-equality of units at different parts of the scale, it

must be confessed, is a serious handicap to exact comparison. Fortunately, the attention of many eminent psychologists¹⁰ has been drawn to it and attempts are now being made for the construction of measuring scales with equal units. If such scales can be produced, and there is no reason why they should not be done, they will certainly be more precise than the ones at present in vogue: measurements conducted with them will certainly have higher scientific value than the results obtainable from the use of the existing scales.

The limitations of the measures, however, are not to be considered as obstacles to the progress of psychological measurement. Methods of measurement in physical sciences accepted as models of precision and accuracy before the days of Einstein have now been shown to have definite limitations. Nowadays a unit of time or of space is not regarded as absolutely the same everywhere. In a strong field of gravity space is contracted and time intervals are shortened. The difficulties arising out of inconstancy of units are thus not confined to mental measurements alone. In this respect there is no qualitative difference between measurements in physics and measurements in psychology. Special difficulties in our measurements lie in the problem of selection of test materials to form suitable measuring scales.

To a French psychologist, Alfred Binet, goes the honour of having first devised a scale for the measurement of intellectual ability of school pupils. This device of Binet was of momentous importance for the development of the new science of ability measurement and it has justly been considered as one of the notable contributions in the whole history of psychology. Since the publication of the Binet-scale in 1906 there have appeared many improved and more perfect measuring scales. At present we have numerous devices for measuring intelligence, mechanical ability, musical ability, artistic ability and other inherent abilities.

Certain principles and procedures are followed in the construction of such test scales. They may be outlined as follows: First of all, in preparing scaled tests it is assumed that the ability which the test materials are designed to measure is distributed normally. If a large number of individuals are tested, the frequency distribution of scores will follow the normal curve. The test materials

which do not give measures that satisfy this condition of normal distribution are not regarded as adequate test instruments.

But it may be mentioned here that there are some practical difficulties connected with the fulfilment of this condition. The experimental data are never exact, so they never exactly fit a normal curve. It remains to be determined statistically how closely the normal curve gives 'fit' to the observed data and how much divergence from perfect normality should be allowed.

Another difficulty, though of a theoretical nature, deserves to be stated here. The assumption that the ability concerned is distributed normally can never be proved in a logical manner, because that would imply the previous existence of the scale, whereas the scale itself is formed on that assumption. There is, however, ample justification for believing in a normal distribution. Most of the biological measurements that we are acquainted with are found to be normally distributed and hence it would not be a violent departure if we assume a normal distribution in mental traits too.

Secondly, in the construction of the scales it is assumed further that the ability which the scale is designed to measure is native. The materials are so chosen that the effects of difference due to training and experience may be reduced to the minimum.

But this condition too, can rarely be satisfied in the construction of the scale. Test scales primarily deal with common materials with which children are more or less familiar. Hence they show better performance results with materials with which they are familiar than with less known things. The influence of familiarity may to a great extent be minimized by taking a large number of test items involving all sorts of materials. For the convenience of administration of the test the number of items has, however, to be kept limited. The influence of experience and education therefore cannot be altogether eliminated. As a consequence it cannot be said without qualification that the scores which we secure by means of these tests are measures of unadulterated native ability.

Thirdly, the items of the scale are so selected that they give consistent results. If the members of a group are tested a second time under similar conditions and if each individual makes a score

which differs very little from his first performance, the test is said to be reliable. More accurately speaking, the test can be said to be trustworthy if the two sets of scores correlate highly with one another. The coefficient of correlation can thus be used as a measure of reliability of test materials. If the coefficient of correlation of test materials is found unsatisfactory and if we are definite that the two scores have been obtained under similar conditions, the suspicion would be that the choice of the test materials has been defective. It is possible to remedy to a certain extent such defects of test materials through proper selection, elimination and arrangement as also by increasing the number of the items. But by no means can the coefficient of correlation be found to be a perfect one. Besides the fallible material, a potent factor of error is that it is never possible to maintain the conditions of experiments and the psychophysical state of the testee constant on the two occasions of examination. It hardly needs be reiterated that the subject's score of performance depends on his interest, effect, emotional condition, past experience, rapport with experimenter and external distraction. However hard one may try to maintain the similarity of these conditions, they are bound to fluctuate. Different individuals will be affected differently by the varying conditions and, as a result, the correspondence between the two scores will never be exact. The question then is: How high the coefficient of reliability should be, in order that the test may be regarded as satisfactory? Authorities seem to have no definite view on this point. Some regard .80, while others consider .60 as the satisfactory criterion of reliability.

Lastly, psychologists are faced with a very important problem, *viz.*, that of the validity of test materials. A test scale is said to be valid when it actually measures what it intends to measure. The intelligence tests claim to measure intelligence. But is there any guarantee that they really do so? It has been said that most of the tests measure an 'unanalyzed hotchpotch of abilities.' Terman and others selected those tests which correlate high with other independent outside measure. Teachers' estimate of the ability of the children under their charge has been used as such an outside measure, but it is obviously very imperfect. Psychologists are still unable to agree as to what they mean by 'intelligence.'

It is very unlikely that the teachers' view will be more concordant. Spearman¹¹ has developed a more scientific method in determining the validity of test materials. According to him an individual's success in a test is determined by two factors, one being general intelligence ' g ' which operates in the performance of all tests and the other being a specific factor ' s ' which accounts for partial success in a given test. The relative weight or importance of ' g ' and ' s ' varies considerably from one test to another. An individual's score thus depends on the extent to which he possesses the two factors and on the importance of each of the two factors in the given test.

Spearman provided a mathematical device whereby the relative influence of the two factors could be quantitatively calculated. By applying his mathematical process it is possible to select test items which are saturated with ' g ' and to isolate those saturated with ' s . ' The idea is that tests which are saturated with ' g ' are valid measures of general intelligence and tests saturated with ' s ' are measures of specific ability. It is no longer necessary to depend on the old-fashioned method of correlating test scores with fallible outside measures to examine the validity of tests.

The test scales have been formed and standardized on these principles, but the scales thus formed are still far from being perfect and being suitable for universal application. When a test scale is standardized by examining, say, a representative group of literate Bengali children it would be an adequate instrument to measure the ability concerned of such children whose habitat, socio-economical position, general level of training and education are the same as those of the group tested for standardization. The scale will not be applicable to children of other nationalities living under different conditions. We should never forget this limitation of the test scales, otherwise we shall be liable to commit serious errors particularly in making efforts at comparisons.

There are many variable factors which influence a subject's score on a given test. On applying the same or similar tests on different occasions within an interval of a month or so the test scores of individuals have been found to vary by amounts greater than the limits of variations set by the coefficient of reliability of the test. It is considered that such variations are due to change

of subjects' interest and effort and also to change of emotional conditions, there being no question of any change of innate ability within so short a time.

A scale is imperfect in the sense that it does not indicate how much of the score of an individual is due to his innate ability and how much of it to other factors. For example, a subject's low score, say 80, which has been obtained with an adequate standardized test scale cannot assess how much of it is due to his lack of innate ability, how much to absence of effort and interest on his part and how much to the inhibitory effect of emotional conditions. It is necessary, therefore, to take particular care in interpreting test scores and differences in test measures. Rearing a child in a better environment may yield higher score but before we make any conclusion regarding his innate ability it must be ascertained whether the difference is statistically significant and in case it is found to be so we should try to determine how much of the difference has to be attributed to better familiarity with the test materials, greater incentive and healthier emotional condition.

I am not in any way minimizing the overwhelming importance of the measurement of abilities. I simply desire to emphasize that mental test scores should never be accepted in the same way as the physical measurements are trusted. Certainly the best test scale measures the ability concerned but it does that within certain limits. We must be familiar with the underlying principles of the construction of the scales as also with the limitations of the test scores before we proceed to interpret and assess them.

Measurements of Aesthetics and Attitudes : In the construction of the scales described above, the performances are scored quantitatively. There are many achievements, *e.g.*, drawing, composition, aesthetic appreciation of colour, etc., which cannot be measured in terms of any constant unit. Achievement in such cases is always measured by comparing an individual production with a scale consisting of 'standard production' of varying character whose values have been determined beforehand. These scales are known as 'Product Scales.' These are constructed on the principle that 'equally often noticed differences in equality' are equal. If a composition 'A' is rated better than a composition

' *B* ' by 60 per cent. of a group of competent judges, and a composition ' *X* ' is estimated better than another ' *Y* ' by 60 per cent. of the same judges then the difference between *A* and *B* is considered to be equal to that between *X* and *Y*. On this basic principle scales of handwriting, composition and drawing have been prepared.

Thurstone¹² and others, however, have questioned the validity of the assumption of the equality of the equally noticed differences and have propounded different methods for the construction of such scales. Taking an entirely original approach to psychophysical measurements, Thurstone¹³ developed a new system in which the categories of judgments in comparing sense-intensities, those in comparing drawings, aesthetics, and affective values of colour, etc., as well as those in giving opinions regarding war, religion and the like, are brought under one general principle. Thurstone states that in comparing sense-intensities the greater the difference between the two intensities the less is the chance of giving equal judgments. The Gaussian function is obeyed in returning judgments. In gauging drawings, etc., the greater the disparity between the two specimens the less is the probability of judging them as same. Here also the distribution of judgment satisfies the psychometric function. Similarly, he states that in giving opinions, say with respect to war, if a man hold a particular opinion ' *A*,' the probability that he will endorse another opinion ' *B*,' depends upon the separateness of ' *A* ' and ' *B*.' The greater the separation the less is the probability of his endorsing the two opinions. It is also a Gaussian function. On the basis of this general principle Thurstone has developed mathematical formulae by means of which values of sense-distances, relative excellence of hand-writing, drawing, composition, beauty and aesthetics, relative values of disparities of opinion and the like, can be determined.

Thurstone¹⁴ has opened a new field of research in quantitative psychology. Problems that could not be attacked before in a quantitative way now yield to measurement. Workers, especially those who are interested in aesthetics and in the problems of social psychology, have not been slow to take note of Thurstone's methods. It should be mentioned, however, that opinions at

present vary, as they will naturally do, in the pioneer stage of any movement concerning the value of both the psychological assumptions¹⁵ and the mathematical principles¹⁶ underlying Thurstone's hypothesis. Inadequacies of the first stage are sure to be removed by further work on this line when new insight gained will bring about refinements of procedure.

Measurement of Individual Differences : In recent years great emphasis is being laid on the measurement of individual differences. The development of the technique of factor-analysis is responsible for this spirit. According to the factorist any test performance of an individual is the resultant of many causal factors. These causal factors are isolable. They are the joint determinants of the individual's performance.

About thirty-five years ago, Spearman found that the various tests of abilities showed more or less close correlations and further he noticed that these correlations tend to form an orderly system or hierarchy. This fact led him to formulate his now deservedly famous two-factor theory. According to this theory when a table of intercorrelations between the scores of individuals of different tests exhibits the hierarchical relation, an individual's performance upon a test can best be explained in terms of two factors: one general ' *g* ' another specific ' *s* '—peculiar for each test.

Since the publication of Spearman's theory many inter correlations of different tests have been determined. But it has been found that in many cases the hierarchy (better known as tetrad equation) is not satisfied. Tryon¹⁷ has demonstrated that in no case, out of the ten studies made by him, the tetrad criterion was really satisfied by the original data. As a result of such criticism Spearman was forced to admit the presence of ' group factor ' which is common to a group of tests. For example, all verbal intelligence tests together with other tests depending on manipulation of language, involve a ' verbal factor ' besides ' *g* ' and specific factors. In the same way all tests of performance contain a ' practical factor ' in addition to the ' *g* ' and specific factors.

The interpretation of hierarchy, on the basis of one single general factor and another specific independent factor, has been contested by Thomson¹⁸ who advances a ' sampling theory ' which

accounts for the hierarchical relations in a better way by assuming the existence of numerous factors which combine in various ways and numbers.

"This superior explanation of the hierarchy in terms of numerous factors as well as Tryon's criticisms have given a severe blow to Spearman's theory. Most of the psychologists at the present time tend to support the view that multiple factors rather than two contribute to ability. But the real interest in the quantitative study of the multiple factor-analysis was not taken until Kelley's¹⁹ works were published in 1928. In 1931 Thurstone²⁰ suggested a mathematical technique for obtaining principal independent factors that are operative in producing a given correlational coefficient of tests as also for calculating the respective influences of these factors on the coefficients.

"Thurstone's method of analysis has been found to be very laborious. Hotelling²¹ has developed a neat technique by which it is possible to resolve with more ease a wide variety of tests into a set of independent uncorrelated factors, as also to assign scores for each of the factors isolated to each of the individual subjects tested. Factorists claim that by means of such analysis they will be able to isolate all possible fundamental factors that are operative in different performances and to obtain individual scores on each of these independent factors. They claim further that it would be possible to represent an individual as a point in a multi-dimension-space, each dimension representing a factor. The position of the individual would be unique, for no other individual possesses exactly the same combination in the amounts of various factors. Clearly an enormous amount of research work will be needed before the whole realm of human abilities be resolved into factors. Difficulties are stupendous but let us hope that all these will be overcome.

Present Position: Theoretical objections raised against the measurement of psychological magnitudes have been partly met; difficulties of mental measurement have been to a large extent overcome. The importance of the measurement of mental traits has been fully realized. Mental scales of abilities are now regarded as the best tool so far discovered for the prediction of the testee's

future educational achievement as well as his vocational success. Relative values of attitudes, opinions, feeling, aesthetics, etc., can be somewhat correctly determined by special devices like Thurstone's scales and methodology. On the other hand, it has been clearly apprehended that mental scales are not as perfect and universal as the physical scales are conceived to be. No mental trait can be measured directly by lying a scale alongside it. It requires a high degree of skill and labour on the part of the experimenter to assess the ability and to interpret the measures properly. There has been a tremendous improvement in the methods of mental measurement and in the technique for proper interpretation of measures within the last twenty years, but still much research is needed before the measurement of psychological magnitudes can approach the reliability and universality of that of physical magnitudes.

Conclusions : Since the pioneer work of Binet a considerable number of studies of mental measurement has been enthusiastically undertaken in various countries, especially in America and Great Britain. In this country not much work in this field has been carried out though, as Bose²² has said that, 'a fair amount of first-rate work has been done' on problems other than mental measurement. The paucity of work is not due to want of enthusiasts. The glamour of intelligence tests has caught the imagination of many and the output of work has been voluminous. But I hope that you will not mind my saying that none of these works have been carried as yet to the final stage of perfection. It is one thing to devise test items similar to already published foreign tests but quite another to standardize them to suit local conditions. No mental test is perfect unless it is properly standardized. The process of standardization involves a large collection of data and statistical work. Most of us fight shy of statistics and statistical formulae. This timidity, I am inclined to think, is greatly responsible for the slow progress of mental measurement in our country. I do not know what the state of affairs is in other provinces but my twenty years' experience in the University of Calcutta has shown that even among the best students interest in the subject of psychology is generally accompanied with

a dislike—sometimes an intense one—of mathematics. This fact itself may be considered as a psychological problem which for the present I leave to the psychoanalysts to solve.

The shyness for mathematics is certainly unnecessary, for it is not very difficult for a seriously minded person to understand the principles of statistical formulae and to apply them properly. Sound knowledge of the principles of the normal probability curve, of the methods of correlations and of some working knowledge of the technique of factor-analysis are no doubt essential prerequisites to mental measurements, but I consider that such knowledge can be acquired without much difficulty within a reasonable time, provided one strives for it earnestly. Training in higher mathematics is not indispensable for acquirement of such knowledge. Even if one fail to master completely the statistical principles his work need not suffer on that account. The Indian Statistical Laboratory at the Presidency College, Calcutta, is ever ready to help the workers in any field of statistical investigation.

A serious drawback, however, should be pointed out and I specially desire to draw the attention of all concerned to it. There is almost a complete absence of co-ordination of the work that is being conducted on mental testing here. The process of standardization of a test is lengthy and laborious. It requires a huge amount of labour both in collecting data and in evaluating the results. It can very seldom be adequately performed by a single individual. What we actually find, however, is just this lamentable fact of individual workers hastily devising tests and rushing to standardize them. Nothing but failure can be the result of such procedure. I should like to suggest in bringing my address to a close that instead of vying with one another in taking credit for first devising and standardizing a test, psychologists of each province should work together to construct scales of tests and to standardize them properly. Non-co-operation may be successful in other fields but intimate co-operation with other workers, frequent discussions about the technique, methods and results are the *sine qua non* of progress in scientific investigations especially in the field of mental measurement. Now that the value of testing has been justly realized, its utility in vocational selection and guidance has been properly recognized, its fruitfulness in educa-

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tional and various other fields has been adequately appreciated, well-planned intensive co-ordinated work is all that is necessary to carry our mental testing programme to the desired level. If all of us who believe in mental testing put our intellectual and material resources together, I am sure we shall be able very soon to reach our coveted goal. For each province then we shall have thoroughly reliable, valid and recognized tests of intelligence, of temperament, of vocational fitness and of various other abilities and aptitudes. The results we shall obtain are bound to be utilized to their advantage by different educational, vocational and industrial organizations of the society. May that day come soon is my earnest prayer.

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Calcutta

REMEDIAL WORK WITH SPEECH DEFECTIVES*

KATAYUN H. UAMA

Introduction : It is surprising to note that in spite of the remarkable advances made during the past few decades in the field of speech-correction in Western countries, and particularly in America, the subject of speech-pathology and speech-rehabilitation has received very little attention in India. The Child Guidance Movement, essentially interested in all deviations from the normal which influence child behaviour, provides good scope for scientific endeavours along these lines. Accordingly, even though it is well nigh impossible to deal with the entire field of defective speech, presenting an extended treatment of speech-pathology together with a discussion of therapeutic methods within the limits of this paper, an attempt is made to outline some of the more recent and important theories, therapies and corrective procedures. Certain cases in the Child Guidance Clinic of The Sir Dorabji Tata Graduate School of Social Work, Bombay, representing distinctive types of speech-defects are also considered as illustrations. Before proceeding further it is necessary to point out that so comprehensive is the subject matter of linguistic science that the speech-correctionist is constrained to study pathologic conditions of speech not alone through the glasses of the speech-clinician or the physician, but also through those of the neurologist, surgeon, psychiatrist, psychologist, physiologist, dentist, sociologist, educationist and phonetician.

* Read before the Psychology Section, Indian Science Congress, Baroda, 1942.

Various Theories: The biolinguistic theory developed at the University of Michigan by Professors Clarence L. Meader and John H. Muyskens is based on the thesis that the conditions of origin and growth determine the character of all developing organisms, and that all structures arise from previously existing structures and all processes as modifications of previously existing functions. These biolinguists, having studied the dynamic processes of language with reference to the evolutionary development of specificity of structure and function, maintain that language is an integrated series of life-serving processes, and that speech is a highly specific emergence from, and conditioning of certain vegetative processes of the organism. For example, the vegetative nervous system develops before the central nervous system; the back of the tongue before the lungs and larynx; the larynx before the tip of the tongue; the tip of the tongue before the palate and the palate before the teeth. Thus each develops in conformity to a definite time-space frame. In effect, the scientists at Michigan taking advantage of these biological facts have based a system of diagnosis and treatment on the facts of inheritance and of normal development during both the pre-natal and post-natal periods, and on deviations from them.

From the biological standpoint, then, it is absolutely essential to determine the point in the development of the speech organs at which the trouble began. The earlier the incidence of the disturbance in the developmental series, the more extensive is the contamination. Speech rehabilitation must in all cases begin with the earliest of the disturbed processes and structures and proceed to the later ones only after improvement is attained on the lower level. Also since serious speech deviations arise from inherited or structural abnormalities, birth injuries, later accidents and from diseases of childhood and malnutrition, the biolinguists insist on a thorough medical examination before any speech therapy is begun. In cases of aphasia for example, where a surgical lesion is present, the surgeon's aid is indispensable, as no improvement is possible without surgical operation.

The psycho-analysts maintain that the cause of stuttering lies in repressed infantile sexuality, in which case, stuttering is nothing

but a fixation of infantile oral eroticism. They assume that the fundamental problem in stuttering is a difficulty arising from marked anxiety due to unconscious emotional complexes, or due to the fact that the stutterer is compensating for his feeling of inferiority by demanding attention through inflicting self-punishment, to gratify his desire for superiority. Inner conflicting needs or personality conflicts may produce in the individual speech disturbances which may simulate any of the organic manifestations. From a practical diagnostic and therapeutic standpoint, however, few are qualified to use the psychoanalytic methods, except those who are physicians, psychiatrists and accredited analysts combined.

Dr. Smiley Blanton of the Cornell Medical College presupposes a study of the development of the nervous system for an understanding of the physical symptoms of stuttering and believes that the cause lies in the emotional conscious and unconscious mind of the stutterer. He holds that the fear-states of the stuttered prevent the cortex from exerting control over the organs of speech and that, therefore, stuttering is primarily an emotional difficulty. The treatment according to Dr. Blanton consists in discovering the infantile emotional reactions and supplanting these with adult patterns. This emotional readjustment he seeks to bring about by studying the family and school environment to ascertain points of conflict and then giving clinical treatment through conferences, individual guidance and practical application of mental hygiene principles.

Dr. James Greene of the National Hospital for Speech Disorders, New York City, views the stutterer as a nervously agitated organism demonstrating strong excitability characterised by chronic hesitation in neuromuscular activity, resulting in disorganized muscular co-ordination. He regards stuttering as a physical symptom of psychic conflict with the high emotional tone of the stutterer directed toward a fear or an anxiety state which disintegrates his entire personality. He advocates a form of composite therapy of a medical, social, psychiatric, psychological nature directed toward the tranquillization and adjustment of personality.

Mrs. Mabel Farrington Gifford, Chief of the Bureau of Speech Correction for the State of California, regards stuttering as purely

psychological. She is of opinion that if a child who is sensitive to parental maladjustment and parental hysterical tendencies, experiences an emotional shock or a vivid unpleasant experience which arouses fear or insecurity, his speech becomes disrupted, resulting in what she calls, "a word-blockade pattern." Her corrective procedure, therefore, takes on a completely psychological character with word association, visualization, relaxation, breathing and practice of key words relating to confidence-building until fluency in speech is restored.

Dr. John M. Fletcher of Tulane University holds that speech defect "should be diagnosed and described as well as treated as a morbidity of social consciousness, a hyper-sensitivity of social attitude, a pathological social response," arising in the child's earliest life from personality relationship and demanding emotional adjustment. He advises that correction of specific mechanisms of speech "should occupy the margin, rather than the centre of attention in speech therapy," and believes that the concept of isolated forms of treatment must give way to that of providing the right type of environment. In short, his therapeutic methods are exactly the opposite of Mrs. Gifford's.

Dr. C. S. Bluemel of Denver, Colorado, is convinced that speech is a conditioned or associated response and that stuttering is an inhibition which occurs before the speech reflex is securely established, and like Mrs. Gifford, advocates that the child should be placed under special medical care for complete rest and isolation.

Dr. Lee Edward Travis of the University of Iowa, works on the theory that the entire central nervous system functions under a dominant gradient, located in the left hemisphere for right-handed persons and in the right hemisphere for left-handed people, and that any conflict between the two hemispheres of the brain is likely to cause stuttering. From this standpoint, then, therapeutic measures necessitate thorough examinations to determine the stutterer's cerebral dominance, or possible lack of dominance between his brain hemispheres. Many tests have been devised to determine native handedness and eyedness, and the decision for shift of hand is made only if the tests and case history justify such a change.

Dr. Russel Meyers of Brooklyn, New York, is convinced that a consideration of the etiology and differential diagnosis of speech pathology is absolutely essential to any rational therapy of speech disorders, because as he points out, manifestations due to developmental anomalies and disease processes in the " peripheral speech mechanisms " constitute the so-called " speech defects." Such speech disorders may be due to deviated septum, faulty occlusion of the teeth or nasal and pharyngeal passages, bifid tongue, hypertrophied turbinates, adenoid growths, cleftpalate and hare-lip. Disease processes of the " segmental speech mechanisms " may manifest themselves as " aphonia " or " dysphonia," while " anarthria " and " dysarthria " are attributed to disease processes in the " subcortical co-ordinating mechanisms " represented by the cerebellum and the basal ganglia, and " aphasia " is a symptom indicating disease processes of the " highest integrating mechanisms " involved in speech, namely, the cerebral hemispheres including the cortex.

Thus Dr. Meyers bases his system of treatment on these etiological and differential factors of pathologic speech and recommends practice in vowels and liquid consonants together with whole words and concrete monosyllabic nouns inducing the patient to receive actively all sensory stimulation—visual, auditory, tactile, thermal, kinesthetic, olfactory—from the object which symbolizes the spoken word.

Therapeutic work at the Child Guidance Clinic, Bombay :
We shall now proceed to consider the therapeutic work carried on at our Child Guidance Clinic in Bombay. As a paper of this nature precludes the possibility of giving detailed case histories of each, we shall limit ourselves to a consideration of the diagnostic and remedial procedures employed in the treatment of a few typical cases. As has already been pointed out, the removal of any disability in pathologic cases of speech disorders necessitates a thorough medical examination. Therapeutic measures and a treatment programme are formulated by the speech therapist only after his diagnosis has been verified by the physician, surgeon, neurologist, psychiatrist, and endocrinologist according to the exigencies of the case.

Case-histories and Discussions : PH, aged 13, was referred to the Clinic on March 15, 1940 by his parents because he stuttered badly and was unable to carry on his studies owing to this handicap. The feminine adiposity round the waist and hips and the particular spasms in speech coupled with the bulky appearance and sluggish movements of the stutterer suggested to the speech pathologist a case of pituitary deficiency on examination. He was sent to the J. J. Hospital for a medical test and was reported as a hypo-pituitary case with high blood pressure and very much overweight.

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The treatment consisted in pituitary injections, alteration in diet, relaxation and breathing exercises for the normalization of high blood pressure and nervousness, and in practice in vocalization and the building up of certain speech reflexes. He had particular difficulty with the voiced consonants and was utterly unable to pronounce the alveolar consonants. In his stutter-type speech pattern K became T, G became DH and KH became Th. After the regular following up of this programme of treatment and constant phonetic drilling, he was able to articulate with ease all the vowels and consonants except the alveolars. However, after two months, that is, by May, his reflexes were built up, and he was able to pronounce K, KH, and G. This gave him a great deal of confidence and joy and his speech as a whole improved with a much smoother flow and a minimum of spasms.

But, there was a serious relapse in June when the speech therapist was on leave. On enquiry, it was found that the absence of the speech correctionist coupled with the discontinuance of the pituitary injections due to pecuniary difficulties had brought about this condition. Some aid was given from a Charity Trust for the continuance of the pituitary injections and intensive therapy was resumed by the speech clinician, with the result that the boy was able to recite poems from his text-books and read his lessons like a normal person by September, 1940. He left the Clinic in November, 1940. Six months later the father reported that the boy has improved in school, that is, his speech is better, but that they were unable to continue the injections in spite of the charitable aid, as they could not afford to waste a great deal of time in the Out

Patients Department of the J. J. Hospital, the boy having to go to school and the father to his office.

P, aged 14, was brought to the Clinic on July 17, 1940, by his uncle because he had lost his speech after failure in an examination and had started behaving queerly, suddenly losing his temper and abusing and beating everybody for no apparent reason whatever.

This was a purely psychological case where the shock of failure in an examination had precipitated the loss of speech and psychotic behaviour. On psychiatric interview it was found that he was a good student and until two years back was doing very well in the school. Mental Test at the Clinic in October, 1940, also revealed an I.Q. of 114 per cent. When he was in the first Portuguese standard, however, he was left with an uncle who made him study all day long. He did well in all the written papers, but when he appeared for his oral examination, he practically lost his voice and could not answer well. He was sure he would pass on the whole, but when given the news that he had failed, he refused to believe it and completely lost his speech. Here was, of course, a case of intense aggression and rebellion against the uncle for compelling him to study incessantly against all his social needs and drives. The inward rebellion and the ego frustration led him to shut himself again, by losing speech or the power of communication and by bursting out aggressively.

The boy was given psychiatric treatment through talks and conferences. He was made to work out his aggression in the play-room. The speech therapist treated him with the result that the initial explosions of isolated sounds gave way to whispers. At this stage, the superintendent of the J. J. Home where the boy was sent informed us that he spoke quite loudly when he was playing with other boys there. The speech clinician worked a little more intensively with him and by November, 1940 he began speaking quite normally and had become very quiet, gentle and docile. Play was given more emphasis in his programme and he was convinced by the psychiatrist that he was a good student and that failure was just part of the game. The J. J. Home superintendent reported that great improvement was noticed in the boy,

that he sang at their camp fire and took an active part in it. At this stage the boy's uncle took him away to Goa as he could not afford to pay for the boy's residence in Bombay. We have not heard from him since.

V, aged 4, referred to the Clinic on February 14, 1940 for stammering was a case of sibling jealousy. He spoke perfectly well until the birth of the youngest child in the family. The aunt stated that the trouble started gradually after an attack of malaria about six months ago. He does not like the baby and says, "I don't want the baby. Don't give all the doodoo (milk) to her."

Here stammering, or rather lisping was resorted to by the child as an attention-seeking mechanism because he is a very pampered, good-looking and smart boy and is not able to stand the idea of the parents' attention being divided between him and the new born baby. He was worked upon by the psychiatrist and the speech therapist, and one day when the speech therapist had succeeded in establishing a good rapport with the child he said, "Oh, I can speak well. I'm doing it only to tease my people," and spoke quite distinctly. However when the case was closed in December, 1940, no change was reported in the boy's attitude and stammering at home.

J, aged 15, was brought to the clinic on May 7, 1941, because he gambles, steals, runs away from home, keeps bad company, beats and abuses his mother and sister and stutters badly. He struggles to utter words and twitches his face before he can bring out a word. The father says that the boy began to stutter since the age of 4 when a woman in the neighbourhood "cast eyes" on him. When the father called at the clinic, he had already given up the hope of improving the boy and had made up his mind to send him to the reformatory as he believed the boy had gone too far to be treated in any other way. He was indignant with the boy for having brought disgrace to the family, and did not want to own him as his son. In fact he seemed rather amused at the idea of any efforts being made by us to improve him. All his harsh measures of beating and abusing the boy having failed, his only hope he thought, lay with David Sassoon Reformatory.

We kept the boy in the Children's Aid Society Home at Umerkhandi and began the treatment at the clinic. The Psychiatric

Social Worker paid frequent visits to the parents and after great difficulty succeeded in changing the attitude of the father towards the boy, until on July 7, 1941 a distinct change in his attitude was observed, and he even showed willingness to take the boy home. The boy was given psychiatric interviews at the clinic. The speech therapist built up his rhythm-melodic pattern, so that there is 60 per cent. improvement in his speech. He reads and when asked to speak rhythmically, speaks without twitching, spasms or hesitation, and sings Indian Movie songs without the slightest trouble. However, when he speaks of his own accord, or when he is excited or tired, he still stammers a little. The boy's delinquency also is practically a thing of the past and he was sent back to his home at the beginning of August. On August 12, 1941 the father reported that J has improved immensely and that he is willing to do anything for him. The clinic is helping him to find a job for the boy and the boy is still being treated for speech and is taught to read Gujarati and English, and to learn figures in English so that placement may be aided.

The most striking case in developmental and structural anomaly, however, was brought to the speech pathologist on August 24, 1941. On examining M, aged 20, the therapist found that the girl who was brought to the clinic because she had never spoken in all these twenty years, was the strange possessor of what appeared to be a bifid tongue or an extended epiglottis. The girl was neither deaf nor dumb and was only able to phonate the vowel "a." She was immediately taken to one of the best surgeons in Bombay, as no therapeutic programme could be instituted without a surgical operation if she had a bifid tongue. The surgeon, on examination, assured the therapist that it was an extended epiglottis. The therapist then started the treatment according to the biological and differential diagnosis approach, and within three sittings succeeded in making the girl pronounce not only vowels and certain liquid consonants but also whole words and short sentences containing monosyllabic nouns.

Conclusion : These few typical cases are cited very sketchily as illustrative of the various measures to be adopted in speech therapy and of the remedial work being done at the Tata Child

Guidance Clinic, Bombay with children suffering from pathologic speech among other disorders. It is hoped that many more will take up this fruitful endeavour and that more Child Guidance Clinics will spring up all over India to serve this vital need of human adjustment.

Bombay

MENTAL FACTORS IN ATTENTION ERRORS*

J. K. SARKAR

Introduction : The main purpose of this paper is to present *the classification of poor observers*. The scientific classification of poor observers on the basis of the different types of the wrong responses made by them is a great gain to experimental psychology. Here lies a fruitful field for research. Any experimenter can find various differences of attitudes towards the stimuli exposed in a tachistoscope.

The study of observers in attention-experiment is mainly the study of those who accept as against those who reject stimuli. This is one of the studies to separate good observers from bad ones and to discover differences of a psychological nature between the poor observers of different-types. The test seems to fathom the workings of the distracted and confused mind—*through their influenced responses*. The difference between good and bad observers is that the differentiation between the clear focus and the vague margin is clear-cut and well-marked in the former, whereas it is not so marked but rather confused in the latter. The clearness-value varies markedly with the good and the poor. The former are objective and fixed, while the latter are subjective and fluctuating. The vague margin or the confused group and responses is in many cases determined by some tendencies which the poor observers carry into the present stimuli. Hence their responses are more or less influenced or confused and indirect, as opposed to the direct or uninfluenced responses that are more or less clear-cut and well-marked. In fact, they are subjective observers.

* Read before the Psychology Section, Indian Science Congress, Baroda, 1942

Experiments : With the help of a tachistoscope 15 stimulus cards were exposed one after another, each containing a 7-place series of letters and lasting for $1/5$ th of a second. 350 subjects (varying from 16 to 23 years in age) were subjected to the experiment and were thoroughly studied under experimental conditions.

Classification of poor observers : The inability to meet or cope with the stimuli is a clue to the constitution of their minds. They tend to sway between two impulses, to approach and grasp the stimulus on the one hand, and to avoid or run away from it. The conflict between these two tendencies results in confusion.

(a) Some poor observers solve their conflict by flight. The general shift is towards more avoidance. The motive of fear is dominant in determining their responses. In consequence, their attention is easily detracted and their detracted attention displays their escape-conduct.

(b) A class of poor observers solve their conflict by cutting short their stimuli. So their range of responses is very limited and their utmost limit is to reproduce three letters out of seven, as found by repeated experiments on them. They suffer, as it were, a sort of regressive inhibition. This condition is due to a state of confusion into which they are thrown, when they are suddenly overwhelmed by their task.

(c) There is another type of poor observers who try to solve their conflict by slurring over or ignoring the series of stimuli or indirectly preventing them at their sources as far as possible. Introspective observation shows that the stimuli presented fly out of their mind. Their inability to force attention is a sign of their poor general ability; their failure due to lack of will to succeed is a token of their confused thinking or low intelligence.

(d) Some poor observers are quite incapable of solving their conflict in any way. They cannot select one path or another nor can they decide the best route of attaining the goal of their striving. The experimental situation brings about a complete blocking of their responses. One may note many examples of deadlocks in their mental activity on the attention level.

(e) Some poor observers are quite indecisive in their mental activity. But in some of them the confusion may be temporary.

The subjects, though not responsive at first, may more or less avoid or cope with the situation afterwards. Their confusion is found to be dissolved into negative or positive activity.

(f) (i) Some poor observers who may be called 'subjective observers' tend to confuse the two phases of attentive process, *viz.*, the objective and the subjective, or the external and the internal. They are incapable of distinguishing between the visual perception and the assimilative interpretation or meaning. The incorrect reactions of these subjective observers are of the nature of apperception. For instance, the stimulus FHNSBCV evokes FINISH; RHQYWG- PROXY; WSDQVGY-WARSO, MCLHGDO-LIGHT; WRDQGYL-WED; VZRMXOR-RAT; LTOSPRA- LOTA, etc.

(ii) The rationalizing or meaning-giving impulse is more or less present in all observers, though persistently and predominantly present in poor subjective observers. That the effort after meaning is a common quality, though varying greatly in importance from individual to individual is verified by a specific tachistoscopic experiment under more adequate and direct control. 27 subjects had to react to 15 7-place series. Then they were subjected to 15 anagrams, each of which was exposed for 30 seconds.

One of the anagrams was like a letter-group, L E A B T made out of the word, Table. The subjects were required to rearrange the contents of the anagrams so as to bring out the original meaningful words set of them. Definite instructions were given to them to read meaning into the material which had been presented without meaning. The results are as follows :

(a) 13 subjects were good in their visual perception but bad in their meaning-formation. They may be called *extracerts*.

(b) 10 subjects were good in both of them. They are normals.

(c) 4 subjects were bad in visual perception, but good in word-formation or meaning-reaction. They are, in a sense, *intracerts*.

In brief, in the case of 10 subjects that are really good, there exists a clear-cut distinction between external (or sensory) clearness and internal (or cognitive) clearness. For them there is a distinct interval between visual perception and inner meaning. These subjects are good and objective. However, different types

of subjects exhibit powers of external (or attentional) and internal (or cognitive) clearness and shows that the meaning-making tendency is more or less present in all subjects good or bad.

(iii) A third kind of experiment was made. 50 subjects were tested both in attention and memory. It is found that a subject having bad attention has invariably bad memory. But it is not necessarily true that a good memoriser is a good observer. It is a very striking fact that a subject tending to give meaningful reactions in attention has invariably the same tendency in memory, but not *vice versa*.

But the question arises as to the causes or conditions of the attention-errors in the form of meaningful words used as responses to non-sense letters which are altogether without their associates. The fact is that in such cases reproducing and anticipating tendencies play a prominent part and the rise of meaning occurs on the ground of meagre visual cues. The confusion made by subjective observers is due to their excessive reproductive preparedness and anticipatory tendencies which are causal for the making of subjective grouping or are responsible for the shaping or colouring of their observation in a tachistoscopic field.

Attention as retrospective or regressive : Attention is either reproductive or anticipatory, either retrospective or prospective. The subjective observers fixate the letters in tachistoscopic test but attend, if there be any, to their internal relationship or assimilative interpretation. They maintain a sort of internal staring process even at the cost of external conditions which the isolated stimulus-letters permit. In them the meaning phase develops on the ground of meagre visual cues. Any and every visual cue suggests to them some meaning or calls forth an image of the past object or experience. To them 'the immediately present stands for something not immediately present.' Here the meaning phase has its root or beginning. The effort to connect what is presented with something else is an effort after meaning. Hence the meaningful words used as responses to meaningless series or the reactions under the guidance of some tendencies which these subjects bring with them into the present situation. Thus, they are the *influenced* reactions which add a setting to what is presented and

attempt to *explain* what is *without* explanation. The lack of ability on the part of the observers to free themselves from the influence of the past blocks their simple acceptance of the present. The *substitution of the present by the past* is the simplest mechanism which they utilize for the purpose of rendering the unacceptable present acceptable or the disagreeable stimulus agreeable. The substitution of the meaningless by the meaningful is the easiest solution of the conflict suffered by them. The condition of conflict leading to confusion is uncomfortable and it is the meaningful reactions that rob the strange stimuli of their puzzling nature and make the uncomfortable situation comfortable and offer relief to the subjective observers. The meaning-seeking is more or less conditioned by the pleasure-pain principle and the meaning-seekers are ease-lovers or pleasure-seekers. In fact, their attitude or attentive activity is retrospective in character.

Attention as anticipatory or prospective: But not only do the subjective observers regress to the past but also extend themselves to the future. To them the present situation (*i.e.*, the presented nonsense material) has not only its antecedents but also its consequents. *Displacement* from the correct order of the constituent stimulus letters (*i.e.*, referring of the third letter to the second place and the second to the third) means that mental activity is too hasty or anticipatory. The mechanism clearly indicates that mental striving is unable to meet the ill-defined present or puzzling element.

On the whole, subjective observers are always for accepting the difficult and roundabout stimulus without the least friction and with satisfaction. Their leaning towards reproduction and recognition or towards the utilization of the past and the future in the present bear testimony to this fact. It is found in the case of 95 p. c. of subjects that those who recall and precall too much attend to the present too little and make too many incorrect reactions. And the results of the class and university examinations support this fact. They show that such poor subjective observers are misfits and even unfits in their examinations. However, the hypothesis may be suggested here that the modification of the present by excessive and uncontrolled recalling and precalling ten-

dencies lies at the root of attention errors called by us influenced (or confused) responses.

Conclusion : *Attending is a process of connecting.* Good observers can establish connection with the present quickly and correctly. Bad observers wander away from the present and connect themselves with the past and the future. The reason is that good observers can inhibit or depress the undue influence of the past and the future and release the present, whereas bad observers more or less fail to do so. Those who depress the present too much lease the past and the future too much. So, some poor observers are over-productive and liberal, while others are under productive, reactionary, or conservative. Some are neutral, some are radical. In fact, the power of depression or inhibitory control is in definite and direct proportion to the power of release in all observers, good or bad.

Attention is a selective activity involving the crude beginnings of valuing or judging. When depression does not work efficiently, a lessening of the grip of the master impulse (*i.e.*, the approaching tendency) on the subordinate one (*i.e.*, the avoiding tendency) occurs and causes a disintegration of attentive consciousness and also determines our influenced, (*i.e.*, confused and meaningful) reactions. The successful working of depression and release dissolves the conflict between the two opposite tendencies, makes them co-operate with each other and gives rise to the conditions under which the stimuli attend full meaning or become the objects of conscious thoughts.

Muzaffarpur

“WHY” AND “WHAT” IN FACTORS*

N. MUKERJI

Introduction : The law of action and reaction is as much manifested in the growth and development of any branch of human knowledge as in a laboratory demonstration. Any theory, belief or trend of thought if persists for some time drags along with it an amount of inertia against any reactionary or opposing view, be it in the domain of physics or physiology, psychology or metaphysics.

In psychology the antagonistic attitude in the ‘no-changers’ has been witnessed twice within the present century. The first cry was raised in 1900 when Freud’s Interpretation of Dreams was published; as Flugel has said, “To most readers they (the deductions) seemed to be both “far fetched” and repulsive.” The second series of cry, which was more intense after a decade than at the outset, was heard after Spearman’s statement of the Two Factor Theory in 1904. Factor analysis has outgrown the doubt, the type of doubt which the parents show towards the steadiness in a toddler. Instead of clinging to the old technique like a cherished religious belief new ideas and schemes are continually being experimented upon and introduced when found to be suitable. Such questions as, “Why factors?” “Are we not going back to the faculty theory?” “Where is the counterpart of mental factors in the physical plane?” are still heard from the quarters where inertia and ignorance reign supreme. However, in the present paper we will dwell upon two common problems, *viz.*, why and what in factor analysis.

“*Why factors?*” :- Eddington has pointed that the “trend of modern scientific views, is to break down the

* Read before the Psychology Section, Indian Science Congress, Baroda, 1942.

separate categories of 'things,' 'influences,' 'forms,' etc., and to substitute a common background of all experiences."¹ The responsibility of factor analysis lies not in a very different path.

Mere measurement in the physical world cannot help the progress of physical science towards any goal, less so in the mental world; the stability of the patches of experience in a living being is so small. Efforts for coming to any conclusion by quantitative estimation of the tiny unstable bits of experience here and there, by dividing the expanse of mind into the so-called elements would only result in the satisfaction of the eagerness for doing something instead of nothing.

The fundamental need for factor-analysis in psychology is the same as analysis in any other branch of science, that is, for describing and classifying the subject under investigation. Mental factors describe the structure of the mind manifesting itself through the various activities in daily life. As true samples of such activities can be observed under laboratory conditions, in the application of tests for instance, the procedure of factor analysis enjoys the additional advantage over the classical academic methods of describing the mind by being pragmatic and the fact that it depends on empirical deductions.

In the procedure adopted in describing the educational progress of a student the usual custom is to enumerate the different subjects studied in the school and portray the particular student's status as found in comparison to his class mates. Instead of following this arduous path, as a factor analyst would suggest the common elements inherent in the different subjects be grouped together and the amounts determined. The material gain in factor analysis lies in *practical economy*. It has been feared sometimes that minute factorisation may ultimately lead to such a vast number of reduced elements, using the term loosely, that ultimately we may find our position to be unmanageable, but in practical field this fear has proved to be without any foundation. We shall discuss this topic later.

It is not only in the field of school subjects or psychological tests but recent studies have shown that the method of factor analysis may be adopted, and quite profitably too, in other branches

¹ The Nature of Physical World—Sir Arthur Eddington, p. 7. (Everyman Library)

of science. Long before the word factor was used in the psychological world it had been conclusively shown that all the phenomena in chromatic vision depend on three, shall we say, factors which had been given the name of primary or fundamental colour. Further, work done by Stephenson, Burt and several of the latter's students have at least shown that it would be hasty generalisation to suppose that factorisation is a technique that becomes inapplicable outside the field of cognitive processes of the mind.

Factor analysis is important not only by dint of its practical economy but to-day we feel its practical necessity too. Any serious student in psychology would prefer a ' few permanent and independent terms of reference instead of a large indefinite number of casual and semi-independent concepts changing from one subject to another. ' It does not matter very much how many concepts are used till we know the limits of the concepts, accuracy in the conceptions and till there is some sort of check which would not allow the terms to be used in a haphazard way. Thus the new technique is helpful in not only describing different persons with reference to certain traits but the traits in themselves are further divisible into some well known concepts.

None of the traits which are commonly supposed to be uncorrelated are really so, for instance the trait of ' verbal ability ' may be as much correlated with ' g ' as not. Orthogonal factors, *i.e.*, the uncorrelated traits, can be arrived at by rigorously following an objective procedure as is offered by factor-analysis. When we reach to any conclusion with regard to such factors only then it would be possible to study psychology with an unbiased approach. Besides, as Thompson suggests, " factors may be more enduring entities than the innumerable and changing tests used to find them."¹

Any scientific mode of study would be of less value if it were limited by its capacity for description alone; prediction is the next stepping stone towards progress. The classification of the various animals and plants into different general and species though had lifted the study of biology from chaos and confusion to more order-

¹ Thompson, G. H.: The Factorial Analysis of Ability. Brit. Jour. of Psy., Vol. XXX, Pt. 2, pp. 71.

ly systems would not have been of much avail if classification were be all and end all.

Correlation matrices and hierarchical arrangements in themselves are descriptive procedures but the deductions, in addition, afford a predictive value. A series of mixed questionnaires is not only helpful in classifying the traits and the subjects taking part in the experiment but the factors discovered may be used for prediction with regard to the broad categories of ability possible by the subjects. To be more clear, high correlations in a matrix may be explained in terms of a common factor entering into all the different abilities. The nature of this particular factor may next be determined with reference to its stability, the amount to which it is involved in the different types of operation among the different people, etc. Now, the factor, let us describe it by the mental 'g,' may be used as a predictive instrument; a survey of the mental field of a student by an analyst should be able to inform the former if he, in future, would be able to hold a University chair or would be fit for the plough only.

Apart from an universal factor there are such factors which have comparatively narrow range of existence, which are present only in a class of operation, for instance, the factor of verbal ability, and they have been labelled as 'group factors.'

"What are Factors?" : If analysis of the mental plane was a necessity, it was necessary, also, that the procedure was based on empirical judgment. But human nature having a greater affinity for concrete substances than abstract ideas there rose a confusion in appreciating the nature of factors. The division of the mind into static structural elements does not find any scientific support, but it was easier to grasp. Whereas the dynamic elements of factors are somewhat too revolutionary. To quote Eddington once more, "Science aims at constructing a world which shall be symbolic of the world of common place experience. It is not at all necessary that every individual symbol that is used should represent something in common experience or even something explicable in terms of common experience. The man in the street is always making this demand for concrete explanation of things referred to in science; but of necessity he must be disappoint-

ed."¹ This demand is one of the reasons why the conception of factors has created such a confusion.

Factor, like intelligence, has been described and defined variously by different authors and followers of varied types of technique. And, as it may be expected, the diversity goes to prove that a definite conclusion is yet to be reached as regards the nature of factors.

On examining the various definitions of factors it becomes apparent that most of the workers in this direction still look upon the causality in factors in the perspective of earlier physicists. As Max Planck argues the theory of causality is not dead but we are waiting for the genius, for the methods and instruments required, to determine the principles of ' strict causality.' But he does not deny that until then the use of ' statistical causality,' at least for all practical purposes, will remain supreme.² If this be the case in the physical sciences which enjoy far superior a position from the point of view of experimental conditions investigations in psychology have no other way but to proceed towards determination of statistical causality, acting forces, to use the popular term, behind our activities being infinite.

It may be expressed at this stage that there are two rather different aspects of factor analysis, *viz.*, mathematical and existential. As regards the first I would like to hear from others more than speak myself. But I deem it an opportune moment to remind Burt's remarks in connection with the mathematical calculations implied in factor analysis. " The Mathematical part of the factorial argument " he says, " is for the most part deductive; and, therefore, like all deductive reasoning, is admittedly unable to guarantee the reality of the results deduced . . . Induction is, therefore, required at two stages, first, at the beginning, to suggest the initial postulates; secondly, at the end, to see whether the empirical facts answer to the corollaries deduced."³

And truly without granting certain postulates, which, of course, would not be devoid of logical background, no research is possible in any branch of science. Here, however, we may notice

¹ *Op. cit.*, pp. 9.

² Max Planck—Where Science is Going? Chap. V.

³ Cyril Burt—The Factors of the Mind, pp. 211.

the obvious difference between faculty and factorial hypotheses; axioms in the latter are means, means to an end which is to be deducted, whereas in the former there is no line of demarcation between means and end.

Anyway, at the outset whatever factors may we grant, general, group, specific or mere factors, existential aspect of factors would remain the same. Broadly, factor analysis is simply a method of abstraction, through statistical means. It presents the various mental "terms" as manifested in behaviour. I hesitate to use the well known expression 'behaviour pattern' for two reasons; firstly, it does not convey the conception of any limit and the various factors *are* limited in their own spheres. Secondly, it sounds to do away with mental characteristics. Burt defines factors as "principles of classification described by selective operators. The operand on which these operators operate is not 'the mind,' but the sum total of the relations between minds and their environment."¹

The definition would be somewhat clear if we take an example. If two astronomers tried to locate a particular star at the same time from two different sources they could use innumerable measurements; but such arbitrary methods would result in serious difficulties in conforming each other's results. It would be preferable if they 'mapped out' the surroundings of the star; they would, therefore, transform their measures into standard forms of 'declination' and the 'right ascension,' *i.e.*, the distance of each star from the celestial equator and the vernal equinox. Thus their data, although, would be different from each other's, yet, would show a clear cut relationship. Factors are equivalent to such axes in world. A student belonging to the Spearman school would, for instance, declare that he interprets 'g' as the mental equinoctial. This sort of location in the psychological world is not altogether novel. Wundt's conception of 'tridimensional theory of feeling' has a similar basis.

Efforts for the determination of absolute mental "terms" or totally independent factors in mind would be not only meaningless and futile but far from any logical principle when we are aware that every bit of our action is determined by and linked with

¹ Op. cit., pp. 227

another action conscious or subconscious, over or otherwise. Even in physiology, to which we owe much and which is the nearest kin to the science of psychology, any idea which endeavours to seek explanation of a gross phenomenon in a single physical unit is refuted. " For that " Sherrington says, " we have to seek rather some attribute of the organization itself."¹ That independent " terms " can be determined to explain the various mental operations is still more naive a notion. The very procedure of determining correlation, which strictly speaking is a method of determining covariance, depends on the relative conclusion of arithmetic mean. Factors thus arrived at signify the *relations* between the performances of different persons and the factor saturations express the extent individual differences, manifested in test-performances, vary in relation to individual variations of more general type.

Arguments are sometimes put forward, mostly by the workers of two-factor technique, against the negative value in factor be denoted as positive or it would be absent or zero. But is this argument substantial? How is it that we do not hesitate to reply on the negative values when the raw scores are converted into standard measures? Visual ability, we express in positive as well as in negative terms. Such value denote only the position of a measure when related to other such measures. Besides, studies in neurology have shown that inhibition is as real a phenomenon as facilitation; and from this standpoint a negative factor may be supposed to be an inhibitory process the presence of which hinders another activity described by a separate factor. Let it be understood, however, that my intentions here are to plead for the existence of negative factors, that admitting such factors would not be illogical. I agree, of course, that a clearly defined fool-proof place is yet to be given to negative factors.

Calcutta

¹ Sherrington, Sir Charles. *The Brain and Its Mechanism*, pp. 22.

MIND IN DIFFERENT PHYSICAL SETTINGS*

N. N. SENGUPTA

Introduction : It is well-known that a change in the environment is commonly followed by changes, large and small, in the mental personality. The basis of such change lies in some cases in a new order of sense-impressions. These, associated as they are with emotional colourings and promptings to new lines of activity, gradually work a marked transformation in the course of mental life. In other cases, the geographical factor brings with it a specific order of occupations and activities which in their turn give rise to a new plane of outlook, emotions and ideas. In certain other instances, again, the geographical factors induce a profound change in metabolism, in the working of the impulses, in the range of overt activities and thus in the whole of the mental personality. It is the purpose of this paper to show how the mental functions enter into the physical properties of the geographical region eliciting from them new hints and meanings and thus creating a new situation for life and its activities.

Every region has its specific appeal to the human system. The organism gives a number of responses in order that it may adequately adjust itself to the many aspects of nature that promise different orders of fulfilment. If these responses and satisfactions are sufficient to maintain the physiological balance of the organism on the one hand and a disposition of quiescence coupled with alertness on the other, a normal condition has set in. The stimulations from the region may, however, appeal unevenly. The stimulations of food, shelter and sex may so collide that the organism may fail to achieve both organic balance and material satisfaction. The character of the region, as reflected in its contrary

* Read before the Psychology Section, Indian Science Congress, 1942.

appeals to human needs, would be represented in conditions of mental disharmony and disorder. These general principles find ample verification in the facts that we are going to consider in this paper.

The "Arctic Hysteria": The inhabitants of the Arctic region are peculiarly subject to a number of mental disorders which have collectively been called "*Arctic Hysteria*." These disorders may not all necessarily belong to the category of hysteria in the strict sense of the term. Their general effect and manner of causation as also several of the symptoms have much in common with the usual phenomenon of hysteria.

(i) One of the common forms of this disorder is said to occur mainly among women. They suddenly begin to utter piercing shouts in the stillness of the night, throwing up their hands and behaving, in general, like children in tantrums. The attacks of this type resemble the maniacal attacks in manic-depressive psychosis.

(ii) A second phenomenon that is common in the Arctic region is that of a marked increase in *suggestibility*. It frequently happens that when children begin to dance, older people, adults and even old women join in. Their movements are, however, not always as innocent as those of children. The frolic of the game often conceals behind it forms of sex-behaviour. The play of children, thus, draws in an entire section of the community and gives it an occasion to express its latent urges through social behaviour.

(iii) A third type of disorder consists in the development of a condition of hypersensitivity. Among the Laplanders and the Kamchatka people "an unexpected touch, a sudden call or whistling, a fearsome and unexpected appearance, throw the people in a state of fury."

(iv) A fourth type of mental disorder is described as *amurakh* which can be translated as a *sensitive personality*. Its early symptom is shuddering, from which certain persons suffer off and on. This is followed by a stage characterised by marked timidity punctuated by stages of fright.

(v) The term '*menerik*' in Turanic language signifies craze or madness. A person afflicted by *menerik* suffers in the beginning

from spasms all over the body. This is followed by a trance-like condition frequently disturbed by howling, dancing and epileptoid seizures.

(ri) The Siberian people seem also to be subject to nightmares and a peculiar type of somnambulistic fits. They begin singing when they are asleep and forget all about it when they are awake.

(rii) There are also attacks of erotic manias as well as schizophrenia which ultimately lead to death by inanition.¹

Arctic Hysteria described above is said to be due primarily to the influence of the arctic climate. The bleakness of the northern regions of the globe, the long winter nights, forced inactivity in the ice-bound zones, all contribute to isolate the personality. As Weyer says: "In a variety of ways, darkness adds to the perils and uncertainties of life. Hunting becomes difficult and traveling dangerous. In short, darkness augments the insecurity that lurks in the unknown, and it allows the imagination of the primitive man full play to create a host of evil working spirits. * *

* * * It is quite reasonable to suppose that the prolonged darkness and monotony of winter contribute to the prevalence of a peculiar mental disorder among the people around the polar basin." The personality fails to maintain the balance which can develop only from an alert and purposive social intercourse and from an active manipulation of objects of the environment. When these resources are not available to the mind, it tends to break up into neuroses.²

Mind in Isolation in the Polar Region: Even people who are not brought up in the tribal traditions of the Arctic region undergo transformations in their mental life when they are subjected to the cold isolation of the polar region. Some of the men who accompanied Nansen, Scott and Amundsen speak of the perpetual sense of foreboding that sets in as people settle down in the ice-bound ships. Others speak of petty peevishness and shortness of temper alternating with expressions of great joy and joviality, reminding one of the *cycloid conditions*. These states do not represent the normal temper of the men who report them.

They set in through the influence of the environment upon the human system.

The monotony of ice is one of the most important factors that contributes to the transformation of mental life. It is a condition for the setting in of the phenomenon known in psychology as that of adaptation. Sense-perceptions lapse into bleakness; feelings both pleasure and pain reach a neutral point. The things of the environment that produce variability in sensations and emotions, thoughts and motor attitudes seem to lose their power of appeal. "When there is no growth or change outside, men are driven deeper and deeper inside themselves for materials of replenishment." When the store is small, men slide back to the more primal stages of the personality, to the childhood planes of their own life.

This explains the fact that bunkmates cease to be on speaking term because each suspects the other of placing his garments at night at the spot allotted to the other. Commander Byrd says that he walked for hours with a man "who was on the verge of murder or suicide over imaginary persecutions by another man who had been his devoted friend." It is better, he suggests, that people should rather live alone under these conditions. "Hating or being hated by a man you could not avoid is a degrading experience." According to him, persons with a mature mental life alone can survive the stress of cold and isolation, for they can live off "their intellectual resources as hibernating animals live off their fat."

Delusions of various order occur under these conditions. One hears out of the great silence "a gentle rhythm, the strain of a perfect chord." A feeling that man is one with the universe dawns upon the mind. The room one sleeps in suddenly shrinks into a non-dimensional unit without any substance. There is a feeling sometimes of "a sort of intellectual levitation." Such feelings alternate with dread, the "impulse to run," with the persistent idea that one is *lost* and *sick inside*. Almost a paranoid delusion of grandeur sometimes occurs. The whole body feels sentient and there is "that exalted sense of identification of oneness—with the outer world which is partly mystical but also certainty." And "it was a fine thing, too, to surrender to

the illusion of intellectual disembodiment, to feel the mind go voyaging through space as smoothly and felicitously as it passes through the objects of its reflection."

Various orders of illusory experience occur. "Presently," says Byrd, "I began to have the illusion that I was seeing also what I was hearing." There are illusions of touch, hallucinations of smell and even of taste. The mind seems to collect its revenue from unexpected sources. At the same time, "the dark side of man's mind seems to be a sort of antenna tuned to catch gloomy thoughts from all directions." All these so often yield their place to a kind of passive self-surrender. "Why resist?" says an inner voice. "Why not let things drift?"³

Such turmoil, thoughts, feelings and attitudes which may just as well settle upon a single individual as upon a group arises from the action of the environment which can be understood in the following manner: Cold and darkness inhibit movement and behaviour. At the same time the organic functions are stimulated. These latter, when intensive, excite the emotional processes. All thought and association develop under the stress of emotions, of which there may be a variety and each of which may follow an uneven course. The motor tendencies can be kept in check only within certain limits. Beyond that they break the bond and produce the maniac states. For, the motor functions have now been associated with unexpressed emotions and implicit ideas. Hence, their course becomes spasmodic and uneven. Thus arise shouting and dancing, frenzy and fight. When the motor-system does not respond to the nuances of subjective states, there are hysterical manifestations. The motor mechanism remains unstimulated by the rudimentary character of the ideational processes; schizophrenia develops.

Mind in the Subterranean Regions: Norbert Casteret who has explored a large number of caves and grottos in France gives an account of illusions that occur under the surface of the earth. There are cases when he was startled by hearing a human voice in a region in which he supposed himself to be alone. He found it to be a distant underground brook which gave a colourable imitation of human voice. Casteret suggests that such must have

been the source of the ancient oracles. In a grotto, the Grotte De la Cigalière, several specialists in hydraulic work had been hearing the roar of a waterfall for some time and they intended to put it to use. Their explorations underground revealed no water though they had been taking due precautions against coming suddenly into a great mass of rushing water. The passing of air through a small hole intensified by echo and by the absence of rival sounds and other sense-impressions gave rise to the notion of the waterfall.

There are accounts of other illusions of hearing, for each of which the author finds a perfectly natural explanation. Some of these can be mentioned here.

(i) *The Magic Flute* : A melodious music, like that produced by a well-modulated flute, was heard several times. The sound is produced by drops of water falling from a height to the clay floor. They hollow out a deep, narrow tube, like a flute. Each time a drop falls into the tube it compresses the air, which escapes with something like a whistling sound.

(ii) *The Magic Thunder* : Certain high thunder-like noises were heard and were terrifying to the uninitiated. Casteret and his companions attribute them to bats beating their wings.

(iii) During one of the rest periods Casteret and his friend were squeezed between the floor and ceiling of a flat tunnel. "Suddenly," says Casteret, "I noticed a very quick staccato sound pounding my ears and even making air and floor tremble. I called my companion's attention to it, telling him to lie still and listen. He was only fifteen feet behind, but heard nothing. Then I detected a sort of resonance from quick blows whose exact nature escaped me. Finally the mystery was explained : incredible as it seems, what I heard were the heart-beats of my exhausted companion. They were heavy blows, which I felt throughout my body by way of the hollow stalagmite floor. This acted as an amplifier, for my companion's chest was pressed to the ground. There was no possible doubt; we went so far as to count his pulse. If I had been a doctor, I could have given my friend a going-over with this natural stethoscope."

(iv) *Exaggeration of Distances* : The slightest natural feature of a cave takes on measureless proportions; a shaft a few yards deep

becomes a chasm, a modest chamber seems an enormous hall, a small pool looks like a lake. Apparently the surrounding blackness, scarcely dissipated by a lantern, makes men lose all sense of judgment and proportion, hiding everything they habitually use for comparison. The eye instinctively prolongs anything that disappears into the darkness, and the prolongation leads to exaggeration. People honestly trying to judge distances and dimensions underground always exaggerate enormously. Inexperienced visitors to caves often multiply the actual distance by ten. The optical illusions above-mentioned, the difficulties of progress over broken terrain, the bad light, the instinctive fear of getting lost, and the uneasy feeling of being in a new world, all multiply time and distance; when one comes to measure, he finds he has taken a couple of feet for a rod. Even specialists are deceived and have to take measurements.

Effects of Altitude : High altitude, whether in the aeroplane or on the mountain top, calls forth a new order of mental functions. Baertsch has carried on observations in the course of flight up to 8,000 metres. The following observations are recorded ⁴ :

TABLE I

Height	Mental Changes
1,500-5,000 m.	Zone of excitation or Euphoria.
Above 5 000 m.	Apathy, disturbance of attention and will. Hyper-sensitive to colour. Audition limited to shrill sounds

These facts are partly paralleled by Smythe's observations. He speaks of low hills as quickening ' life to a nobler rhythm,' as blotting out the worries and investing the body with a certain lightness. But the high altitudes seem to have an altogether different effect. Smythe mentions the following effects that he has observed : (i) There are certain moments of ' black out ' when the mind loses control of the body. (ii) A feeling of exhaustion makes its appearance off and on. (iii) There are instances of collective hallucination. The whole party saw a kind of glow emanating

from their boots. (iv) There are hallucinations of being accompanied by or following by some one.⁵ The following table has been computed from the observations of the Kamet and the Everest Expedition parties :

TABLE II—*Record of the Kamet and the Everest Expeditions.*

Height	Mental Changes
16,500 m. ..	Outlook and attitudes change.
23,000 m. .	No aesthetic joy—lassitude.
21,500 m. ..	Bad temper, quarrelsomeness, loss of common sense and capacity of judgment. Blunting of the senses
25,000 m. ...	" Don't care what happens " feeling.

TABLE III—*Other Similar Observations*

Person	Place	Year	Height	Psycho-physical Changes
Pieppig ...	Andes	1827-32	4,350 metres	Anxiety and discouragement.
Meyen ...	..	1831	5,640 ..	Nausea, fury and fainting.
Maw ...	..	1827	2,190 ..	Spirits elated.
Laverriere ...	Mexico	1857	5,280 ..	Anxiety, disquiet, dread.
Saussure ...	Alps	1788	3,360 ..	Irritable, angry.
Auldigo ...	..	1827	4,200 ..	Exhausted, downcast, discouraged.
Ramond ...	Pyrennes	...	3,350 ..	Stimulated.
Tissandier ...	Balloon	1875	7,500 ..	Inward joy, glad to be rising.
Douglas Haldane Handerson Schneider } ...	Pike's place.	1912-13	4,295 ..	Senses dulled, memory affected unreasonable, judgment im- paired, uncontrolled emotion at outbursts.

General Conclusion : The normal pattern of mental life is maintained through a series of stimuli that the environment showers on man and through a correlative series of responses.

Arctic cold, height and depth serve to cut off man from his usual social reactions. The individual is thus thrown back upon the resources of his own mind. The urgent needs of social behaviour no longer lend a shape to man's conduct. The social sentiments and traditions lose their influence upon the course of ideas and imagery. The *mental set* that invests all conscious processes with a social context seems to dissolve. The mental functions, thus loosened from their social moorings, pursue a strange course. New shapes and patterns of imagery and emotions appear in the field of consciousness.

At the same time the body finds itself in a changed *milieu*. The internal organ of circulation and respiration operate under new and probably unaccustomed conditions. The entire system of organic sensations thus undergoes a crisis. The new patterns of thoughts and feelings find themselves upon a new background built up by these organic sensations. Even the old images acquire new meanings. Connected ideas break up into fragments. The mental life thus acquires new trends and settings.

The new stress on the organic life produces an intensive effect on the *optic thalamus*. Emotions abound in the field of awareness. The partial inhibition of the motor channels leaves the emotional tension unrelieved. An emphasis on emotions impairs thoughts and judgments. And the mind regresses to a relatively earlier level of development and evolution. Such a transformation explains the effects that are observed.

Lucknow

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INTROSPECTION AND THE REASONING OF CHILDREN

T. K. N. MENON

INTRODUCTION : The most important study of children's reasoning made in recent years is the one made by Piaget, the great child psychologist of Geneva. Piaget has worked out with all details a theory of Ego-centrism to explain children's reasoning. His conclusions on the subject are as follows :

(1) The thinking and reasoning of children below 8 or 9 and to an appreciable extent up to 10 or 11 are marked by ego-centrism and its allied characteristics of syncretism, synthetic juxtaposition and transduction.

(2) Piaget advances the theory of definite stages in the mental development of the child, *i.e.*, first autistic thinking, then ego-centrism, then socialised thought culminating in the power to think and reason like adults. His theory is that the social instincts make their appearance at about 7 or 8 and that the intellectual factor and reasoning show themselves only then.

(3) At about 7 or 8 the forms of logical reasoning make their appearance only in the field of perceptual intelligence. Not until 11 or 12 years does full formal reasoning on the verbal plane become possible, and this for two reasons. Not until then there is the ability to become aware of and to order the operations of thought as such fully developed, and not until then the child is able to take the true 'as if' attitude and carry out a mental experiment on the plane of pure hypothesis or pure possibility as distinct from the plane of pure reality reproduced in thought. The latter condition is very clearly a consequence of his social development and of the growth of the ability to place oneself at a point of view other than one's immediate perception.

(4) The child does not understand the relativity of ideas or notions until he is eleven.

(5) Till about 11 years of age, the child does not succeed in describing his reasoning process as such, *i.e.*, he is not capable of introspection.

During 1933-35, the present writer was engaged in a similar investigation in the Madras University. The problem of research was "Is Ego-centrism undissociably and intricably associated with the reasoning of children between 8 and 9? If it is, to what extent, and under what conditions?" This paper deals with one of the points of the investigation, *viz.*, Ego-centrism and Introspection.

FIRST STORY: *Theory and Procedure.* In ego-centric thought, subjective interpretation predominates; there is no felt need for verification and the thinking is little controlled by practical needs. Such thinking is not under the control of objective reality. It is therefore natural that ego-centrism of thought entails a good deal of lack of consciousness. Anyone who thinks for himself and is consequently in a perpetual state of belief or confidence in his own idea will naturally not trouble himself about the reasons and motives which have guided his reasoning process. Therefore if the child cannot introspect and fails to go back successfully through the steps of his reasoning process, it may be because his reasoning process is vitiated by this factor of ego-centrism. An analysis of the answers to questions on introspection should make this point clear.

Burt's Reasoning Tests were revised to suit local requirements and they were administered to fifty children (ages 8 to 9) belonging to Classes IIIA and IIIB of the Kindergarten Section of the Teachers' College, Saidapet (Madras). After the tests were administered and answers got, the child was asked "How did you find that out?" Supplementary questions were put wherever necessary to find out whether the child was capable of explaining how he reasoned.

Conclusions: An analysis of the correct and incorrect answers and the reasons given in support of these showed that a large number of children were capable of correct introspection and where the child failed to give a satisfactory answer to the question "How did you find that out?", it was due to one or more of the following:

(1) Children's inability to express all their thoughts. This language difficulty was the main cause.

(2) Their inability to understand the adult requirements.

(3) Their assuming that what is expressed is complete, *e.g.*, that the last step is enough and that they are understood.

SECOND STUDY: Procedure and Theory. In practice simple problems of arithmetical reasoning provide the best means for the study of children's introspection. In the case of these tests the experimenter can easily see from the child's answers and reasons what line he has followed in his reasoning and which are the operations of thought that have taken place. Further in these cases, introspection does not require any considerable verbal facility on the part of the child since it is sufficient for him to say "I took that away or I added this, etc."

The following tests were therefore administered to our age-group and the subjects asked as to how they arrived at the results.

Tests: (1) Father bought 18 bananas from the bazar. Mother said "They are not enough, we want 9 more"; on the whole, how many bananas do they want?

(2) Last year there were 30 children studying in that class. 6 children did not get promotion. How many children got promotion?

(3) A bench is 4 feet long. There are three benches put in a line. What do you think is the length of the line of benches?

(4) There are 40 drumsticks. We want to bundle them in 4 equal bundles. How many shall we put in each bundle?

N.B. Care is taken to see that the material of the arithmetical problems is very well-known to the child.

Before discussing the results obtained, it is necessary to mention the conclusions of Piaget after his study of 50 boys (ages 7-10) by means of similar arithmetical tests. He says the child's initial difficulty is in telling us how he obtained a solution (whether right or wrong is of no consequence here). Either the child is incapable of retracing the steps he has taken or else after the operation is over he invents an artificial series of steps and becomes the dupe of illusions concerning the perspective of his own thought, taking as the starting point what was the final goal. Everything happens as though the child reasoned in the same way as we do ourselves when we solve a purely empirical and partly manual problem (a puzzle, a trick box, etc.), when we are conscious of each result (failure or partial success), but do not direct or control our movements, and above all, are incapable by introspection of recapitulating the successive steps which our mind has taken. Piaget distinguishes three states in the evolution of children's introspection. In the first, the child, if he is presented with an easy question, immediately finds an answer by quasi-automatic adaptation, but is incapable of saying how it is done. During the second, the child has to search and grope for the solution, but is incapable of immediate introspection. During the third, introspection becomes possible. In the first case, instead of giving an accurate retrospect, the child starts from the results he has obtained as though he has known it in advance, and then gives a more or less arbitrary method for finding it. The child here is not at all conscious of his thought. In the second case, the child gives a retrospect of the steps. Here the child is conscious of the steps of his thought, but is not very clear why he went through these steps. In the third case, the child gives a clear logical reason, and is conscious of the steps of his thought and why he went through them.

The above views of Piaget were taken into account in evaluating the answers; an attempt was made to find out whether the three stages of the evolution of introspection did

exist and the following answers were accepted as representing correct introspection :

Test I. (1) I added 18 and 9.

(2) $18 + 9$ is 27.

(3) Both 18 and 9 put together make 27.

Test II. (1) If you take 8 out of 30, the result is 22.

(2) $30 - 8$ is 22.

(3) $22 + 8$ is 30.

Test III. (1) 3 times 4 equals 12.

(2) If you add 4 three times it is 12.

(3) $4 + 4 = 8$, $8 + 4 = 12$.

Test IV. (1) Four times ten = 40.

(2) There are four tens in forty.

(3) $10 + 10 = 20$, $20 + 10 = 30$, $30 + 10 = 40$.

Results. The following results were obtained :

Test	No. of children tested	No. who could introspect correctly	Percentage
1	40	39	97.5
2	40	39	97.5
3	40	38	95
4	40	37	92.5

(1) Average age—8 years 7 months.

(2) These figures would have been higher but for the fact that one of the children tested was very backward as was revealed by the results of all the tests used in the investigation and by his school record.

THIRD STUDY : Procedure and Results. In view of the very high percentage of correct results obtained for the 8-9 age group, it was thought necessary to repeat the investigation with children of the next lower age-group. 20 children of

Class II (ages 7-8) were chosen at random and tested. The following results were obtained :

Test	No. of children tested	No. who could introspect correctly	Percentage
1	20	20	100
2	20	20	100
3	20	19	95
4	20	15	75

Average age—7 years 2 months.

GENERAL CONCLUSIONS : The analysis of the correct and incorrect answers got in Studies II and III led to the following conclusions :

(1) Indian children between 8 and 9 and also between 7 and 8 do not experience any difficulty at all at correct introspection provided (a) the steps of introspection are not many and are not complicated and complex, and (b) the expression of the steps of introspection does not entail verbal difficulty.

(2) The small decrease in the percentage of correct answers in the case of Test IV with children of the lower age-group was not so much due to their incapacity at introspection as it was due to their inability in solving the problem itself, i.e., in doing an example in division. In these cases, the tendency to give an arbitrary or wrong reason was more : (1) when the answer given to the test is wrong (not conscious), (2) when the answer is a fluke (conscious), and (3) when the child is otherwise conscious that he is wrong.

Therefore the reasons given in Study I seem to be the real reasons why the child fails to succeed at introspection when complex problems are involved. It is not correct to say that the child of 7-9 cannot introspect. Piaget's illustrations of the three types of answers corresponding to the three stages in the evolution of children's introspection have not been met with in the results of the present investigation.

BARODA.

ASSESSMENT OF THE BEAUTY-VALUE FOR AESTHETIC STIMULI

N. S. N. SASTRY

INTRODUCTION : Aestheticians from the earliest times and psychologists of the present century have been trying to solve the problem of aesthetic enjoyment, with varied success. Some have asserted that Beauty exists by itself, while others have maintained that it is only an attribute. Some have held the opinion that the value lies within our own mind, while others have tried to maintain that it is in the stimuli. But, it is noteworthy that many have believed that it is an emergent.

Since both the experiencer and the stimuli partake in the emergence of the beauty-value, it is at once suggested that both the subject and the object are responsible for yielding this value. This value might be taken, for purposes of the present investigation, to be represented by the aesthetic significance of the experience. This paper suggests a possibility of assessing the object's contribution towards this final resultant, *i.e.*, aesthetic experience.

In a previous contribution,* the author tried to point out the possibility of formulating a scale for measuring aesthetic susceptibility. In that attempt, a subject's rating of a stimulus was compared with the group norm and the positive or negative divergence of the adjudged value from this norm was taken to indicate the aesthetic standing of a subject from the point of view of the group.

The same type of 'social norm' is used here also.

PROCEDURE : Ten coloured reproductions of paintings and

* Sastry, N. S. N. : An Experiment on Aesthetic Value, 1939; *Proceedings of the Indian Science Congress*. Also, see 'Experience and Expression of Emotions,' 1939; *Indian Phil. Quarterly*, by the same author.

seven selections of music were used as the stimuli. Forty-four subjects took the test.

The pictures were presented, one by one, to the subject. The subject was asked to give his judgment whether the picture was 'pleasant' or 'unpleasant' or 'neutral.' This we call the 'affective judgment.' Then he was asked to indicate the degree of pleasantness or un-ppleasantness of the picture on a ten-point scale. If the picture was extremely pleasant, producing the highest bliss as it were, he was to give it 10 marks. If it was the ugliest, the worst experience, he was to give it 1 mark. The intermediate pictures get the intermediate value. This score we call the 'affective score.'

Then, the pictures were all spread before him. It is only now that all the pictures are exposed to his view at the same time. He is now asked to pick up the best picture. Then the next best and so on. Thus all the pictures are arranged in the order of aesthetic significance. These ranks are called the 'affective ranks.'

The stimuli are not presented in any particular order.

The musical selections were all recorded ones. Therefore, they were played on a gramophone machine. The subject was instructed to listen to it in his own way. After the selection was played, he was asked to say whether it was pleasant or un-ppleasant. Thus we get the affective judgment in regard to each of the musical selection, just as in the case of the pictures. Next, the subject is asked to rank the song on a 10-point scale for its aesthetic worth. As before, the best, *i.e.*, aesthetically the highest, is to be given 10 marks and the worst is to be given 1 mark. Thus we get the 'affective score' for each of the musical stimuli also.

Since these selections could not, obviously, be presented simultaneously, the ranking method could not be used and hence we do not have the 'affective ranks' for the musical pieces.

Here also, there was no particular order in the presentation of the stimuli.

DATA AND DISCUSSION: There are in all 44 subjects who have taken the tests. There are in all 17 stimuli—10 pictures and 7 musical selections. The pictures are to a certain extent representatives, *i.e.*, there are in the series reproductions of great masters, still life, natural scenery, advertisement pictures, etc.* Similarly, in the music series also :

The subjects have pronounced their judgments that a particular picture is pleasant or not. The following table shows the distribution of the judgment for the several stimuli.

TABLE I—*Showing the distribution of affective judgments for one of the subjects.*

Subject No. 44, M. R.

Stimulus	Pleasant	Un-pleasant	Neutral
PICTURES			
1. Prithviraj	—	—	—
2. Abhiman	—	*	—
3. Day break	*	—	—
4. Day Dreams	—	—	*
5. Taj Mahal	*	—	—
6. Rose time	—	—	*
7. Ideal	*	—	—
8. End of Journey	—	—	*
9. Temptress	—	*	—
10. Shakuntala	*	—	—
MUSIC			
1. Violin	*	—	—
2. Indu Bala	*	—	—
3. Flute	*	—	—
4. Raga sudha	*	—	—
5. Nagumomu	—	*	—
6. Alakala	—	*	—
7. Namasthe	—	—	*

Now, let us see how the 'affective judgment' is distributed. The following table shows the distribution of these judgments :

* The pictorial stimuli are listed in the above table. The musical stimuli are : 1. Violin by Choudayya, 2. Vocal by Indu Bala, 3. Flute by Sanjiva Rao, 4. Vocal by Kittappa, 5. Vocal by Musuri, 6. Vocal by Araikundi, and 7. Vocal by Ramanath Sastry.

TABLE II,—*Showing the distribution of the 'affective judgments' for the group.*

Stimulus	Pleasant	Un-pleasant	Neutral
PICTURES			
1. Day break	35	1	8
2. Taj	31	6	7
3. Abhi	34	4	6
4. Prith	40	1	3
5. Rose	26	12	6
6. Ideal	27	10	7
7. End	22	16	6
8. Tempt	14	22	8
9. Day	30	4	10
10. Shak	8	30	6
MUSIC			
1. Nagu	27	10	7
2. Nama	11	21	12
3. Raga	35	6	3
4. Alak	14	21	9
5. Indu	39	3	2
6. Violin	42	0	2
7. Flute	31	4	6

Therefore, (1) The group as a whole judges the following pictures as pleasant: (1) Prith, (2) Abhi, (3) Day break, (4) Day, (5) Taj, (6) Rose, (7) Ideal and (8) End; and, the two pictures 'Tempt' and 'Shak' are unpleasant. (2) The group as a whole judges the following musical selections as pleasant: (1) Violin, (2) Indu, (3) Flute, (4) Raga, (5) Nagu; and the two selections 'Alak' and 'Nama' as unpleasant.

(Note: The group tendency is marked off by nearly 70% of the group giving a particular judgment.)

Also, according to the frequency distribution of the affective judgment, we find a gradual lowering of the frequency of 'pleasant' affective judgment, as we go down from the 1st to the last picture or the musical selection. It is indicated by the arrow in the following table:

TABLE III.—*Showing the lowering of the frequency of affective pleasant judgments.*

Stimulus	Frequency	Rank	Remarks
PICTURES			
1. Prith	40	1	Pleasant
2. Abhi	34	3	"
3. Day break	35	2	"
4. Day	39	5	"
5. Taj	31	4	"
6. Rose	26	7	"
7. Ideal	27	6	"
8. End	22	8	"
9. Tempt	14	9	Un-pleasant
10. Shak	8	10	"
Music			
1. Violin	12	1	Pleasant
2. Indu	30	2	"
3. Flute	34	4	"
4. Raga	35	3	"
5. Naga	27	5	"
6. Alaka	14	6	Un-pleasant
7. Nama	11	7	"

Now, let us take up the affective scores for treatment. These scores are on a 10-point scale and they represent the capacity of the stimuli to yield pleasure or un-pleasure as judged by the subject. That is to say, the subjects indicate on a 10-point scale the degree of pleasantness or un-pleasantness. The following table shows the average affective score per stimulus.

Therefore, (1) there is very high agreement between the frequency distribution of the affective judgment and affective score. It means that we can safely expect that when a subject says that a stimulus is pleasant or unpleasant, he also has an approximate idea of the strength of its pleasurable or unpleasurable quality; and (2) both from the point of view of the affective judgment as well as from the point of view of affective score, there seems to be a certain amount of uniformity (as represented by the high correlation of coefficient) in the judgment of the aesthetic standing of the stimuli.

TABLE IV.—*Showing the average affective score per stimulus.*

Stimulus	Avg. Affective score	Rank
PICTURES		
1. Prith	6.6	2
2. Abhi	6.0	5
3. Day break	7.1	1
4. Day	6.1	4
5. Taj	5.7	7
6. Rose	6.4	3
7. Ideal	5.9	6
8. End	4.4	8.5
9. Tempt	4.4	8.5 (Un-ple.)
10. Shak	4.0	10 (Un-ple.)
MUSIC		
1. Violin	7.6	1
2. Indu	7.1	2
3. Flute	6.6	3
4. Raga	6.0	5
5. Nagu	6.1	4
6. Alak (Unpleasant)	5.1	6
7. Nama (Unpleasant)	4.6	7

For pictures : r between frequency rank of affective judgment and rank of affective score is $+ .860$, P.E. $\pm .0419$

For music : r between frequency rank of affective judgment and rank of affective score is $+ .932$, P.E. $\pm .0417$

AFFECTIVE RANKS : As has already been stated only the pictures were ranked for their beauty-value. The following table shows the average rank given to the pictures.

TABLE V.—*Showing the average affective rank for each picture*

Stimulus	Avg. Affective rank	Group rank
1. Brith	3.6	2
2. Abhi	4.8	4
3. Day break	3.5	1
4. Day	5.5	6
5. Taj	4.9	5
6. Rose	5.7	7
7. Ideal	4.7	3
8. End	6.1	8
9. Tempt	7.2	9
10. Shak	8.7	10

The above table indicates the ranks that the group as a whole would give for the several pictures, for their beauty-value, by adopting the ranking method.

We have now three assessments of the beauty-value of pictures, i.e., (1) frequency of affective judgments, (2) the average affective score and (3) the rank given by the group as a whole. These three criteria ought to enable us to arrive at a figure indicative generally of the beauty-value of each picture.

The coefficient of correlation between the three criteria is as follows :

Between (1) frequency of affective judgment and average affective score is +.860, P.E. ± 0.419 ;

(2) frequency of affective judgment and group rank is +.906, P.E. ± 0.147 ; and

(3) average affective score and group rank is +.937, P.E. ± 0.287 .

Thus it is clear that whatever is measured by any one of the three criteria is also measured by any other. To that extent we might say that the average of all these three ranks would increase the reliability of the figure representing the beauty-value. The following table shows the average as yielded by the above three criteria.

TABLE VI.—*The aesthetic standing of the stimuli*

Stimulus	Total rank of the three criteria	Final rank
1. Prith	5	2
2. Abhi	12	3
3. Day break	4	1
4. Day	15	4.5
5. Taj	16	6
6. Rose	17	7
7. Idol	15	4.5
8. End	24.5	8
9. Tempt	26.5	9
10. Shak	30	10

In regard to music, it has already been stated that for obvious reasons it was not possible to get the subjects to rank the

selections for their beauty-value. Therefore, we have only the affective scores and the affective judgments to go by. Treated in the same way as above the aesthetic standing of each musical selection is as follows :

TABLE VII.—*Showing the aesthetic standing of the musical selections*

Stimulus	Total rank of the two criteria	Final rank
1. Nagu	9	5
2. Violin	2	1
3. Flute	7	3
4. Raga	8	4
5. Indu	4	2
6. Alak	12	6
7. Nama	14	7

Coefficient of correlation between the frequency of affective judgment and affective score is $+0.932$, P.E. ± 0.117 .

Thus, we might presume that the stimuli are assessed in the way indicated in the above two tables, for their pleasantness or un-plesantness. And, granting that beauty causes pleasant experience and ugliness causes unpleasant experience, we might say that the stimuli are assessed for their beauty-value. The following table shows the final rank for each stimulus for its beauty-value as assessed by the group.

TABLE VIII.—*Showing the final beauty-value for the several stimuli*

Stimulus	Rank	Stimulus	Rank
<i>Pictures</i>		<i>Music</i>	
1. Day break	1	1. Violin	1
2. Prith	2	2. Indu	2
3. Abin	3	3. Flute	3
4. Day	4.5	4. Raga	4
5. Ideal	4.5	5. Nagu	5
6. Taj	6	6. Alak	6
7. Rose	7	7. Nama	7
8. End	8		
9. Tempt	9		
10. Shak	10		

CONCLUDING REMARKS : For the group of subjects tested, we might say that the stimuli are aesthetically significant as indicated by their ranks. It is possible that in one estimation these ranks might vary. Some stimuli might become more or less significant aesthetically. For example, the picture ' Day Break ' which gets the first rank might be placed third by some one. To the extent indicated by the divergence, *i.e.*, $3-1=2$, the stimulus has suffered at the hands of this individual. Similarly some stimuli might ' gain. ' It is suggested that the divergence referred to is indicative of the result of the dynamic co-mingling of the subject and the object, *i.e.*, the emergence of the final beauty-value.

Obvious criticism of the above is that the assessed beauty-value holds good only for the group. But a proper selection of subjects improves the matter. We must care for ' donors more than for data '.

MYSORE.

SHORT COMMUNICATIONS

A TEST FOR READING ABILITY*

SAROJENDRANATH ROY

It is generally recognised that the three R's represent the fundamental and basic principles of all general educational systems. The importance of these three R's, that is reading, writing and arithmetic in spheres of education can hardly be questioned. Research has shown us that the amount of mastery or skill of individuals in each of these three R's depends upon certain special abilities. The total absence or variation in-degrees when present of one or other of these abilities in different individuals makes them differ from one another regarding the proficiency they attain in the basic educational factors. These special abilities can be distinguished and their respective degrees assessed by the help of suitable psychological tests. In this paper an attempt has been made to study some problems regarding the first of the three R's, only,—that is, Reading. Capacity to read as I have already indicated, is dependent upon certain special abilities. I will henceforward connotate these special abilities as reading abilities. The idea behind this attempt is to find out norms of different age groups for reading abilities. The plan, procedure and other details of the investigation are presented below.

It is found that the value or importance of reading changes its character when it is looked at from different angles. To the psychologists, reading represents a technique 'to get responses of meaning from an arrangement of highly artificial symbols,

* Read before the Indian Science Congress, Benares, 1941.

we call the alphabet.' From the standpoint of education it is an essential desideratum because it is used as a tool of learning. For gaining information and knowledge in different subjects, for intellectual pleasure, reading provides ample scope in these days. From sociological point of view, reading is important because it easily enables us to have pictures of different races of different countries and of different ages. Not only is it important for broadening one's range of information or for the purpose of generating pleasure, but it is important also as has been lately realised for some significant issues of vocational efficiency.

Whatever point of view we may adopt, psychologically considered, ability to read always implies, comprehension and a certain amount of speed. Comprehension and speed are the major factors which govern the quality and quantity of reading. These are however not the only factors of influence but there are two others, *viz.*, accuracy and expression. In other words, four factors, namely, comprehension, speed, accuracy and expression, have been found to exert a dominant influence on the ability to read. There are others, such as, materials to be read, spacing of words and lines, size and kind of type, illumination of room, individual attitude etc., etc., but the influence of these is not so significant as that of the former ones. The four major factors however are very closely interrelated; the disturbance of one of them results in affecting one or other of the factors to an appreciable extent. Thus lack of comprehension may affect expression, inaccuracy of reading may result in a lesser speed and so on. It turns out therefore that from one factor we can determine to a certain extent, at least, directly or indirectly the quality and quantity of other factors. This fact is very important and about this I shall speak later on.

It appears from the above, therefore, that reading process is complicated by good many factors. This raises some important problems. Can reading ability in all its aspects be measured? If so, what are the means by which the measurements

have been properly analysed and measured. The most important measurements made of reading abilities are those connected with standardised tests. Of the standardised tests, it appears that no single test measures all aspects of reading ability. Thus in the tests conducted by Gray's Standardised Oral Reading Paragraph no attention is paid to the factor of comprehension. It is purely limited to the field of speed and accuracy. Again in the 'Stanford achievement tests,' comprehension is the only factor that is singled out for measurement. There are certain tests of course which claim to measure more factors than these, but only a few of them are reliable from the statistical point of view.

Another point should be mentioned in this connection. There are two ways of reading,—silent and oral. It is a fact that oral reading holds its sway in child life. As the child grows older he gradually resorts to silent reading. For my present purpose which is to measure the major aspects of reading ability, *viz.*, accuracy, expression, comprehension and speed, oral reading method is more suitable than the silent reading method. I therefore had recourse to oral reading method.

Two passages are selected from a Bengali text-book of Matriculation standard. The qualities of these two passages were different in respect of difficulty and richness of vocabularies. The idea for the selection of two passages was to standardize them for two different groups of age levels. Of the two passages one was meant for subjects up to the age of 12, and the other for those beyond that level. The reason for making such a wide provision for age levels, was only to test the effectiveness and practicability of the scheme. On the basis of the results a further subdivision of age groups can be made in future. The subject to be examined is seated comfortably in a quiet, illuminated room with the printed selection before him. The examiner draws the attention of the subject and asks the latter ment can be effected. Psychologists have studied these problems systematically and most of the factors, I have referred to above,

to listen carefully to what he says. He then reads out the following instructions :

1. Start reading when I ask you to start, and stop the moment I ask you to do so.

2. Pronounce words correctly and read distinctly, because if your reading appears to be indistinct, you will be penalised for that.

3. Be careful of your reading, so that not a single word is omitted, modified, added or substituted by another.

4. Observe the rules of punctuation, that is, give necessary pauses where there will be notations for such, or in other words try to read with comprehension.

5. Try to read as quickly as you can, remembering the instructions I have just given you.

Two trials are given, each of 5 minutes' duration. The first is intended to be a practice trial and so the results are not recorded. After 2 minute' interval the second trial is given and record is kept of the subject's performance. Two facts about the subject's reading are noted :

a. The number of words read by the subject within the time limit.

b. The quality and quantity of errors.

A classification of errors is necessary for reasons I will presently mention

Three groups may cover all the errors in reading. The first one comprises errors of punctuation, the second, errors of omission, addition, modification and substitution and the third those of pronunciation.

Now as to scoring. Subjective method of scoring has always been discouraged on grounds of inconsistency and unreliability. So a well thought out plan for an objective scoring was given effect to. It is the usual practice in certain speed tests like Telegraphy, Typewriting, etc., to consider mistakes of all kinds under one group. It is upon the quantity of mistakes and not their quality that the scoring is based upon in these tests. For

every mistake, whatever its nature may be, certain number of words is deducted from the total and the total number of words thus obtained after deduction, is then divided by the total time in order to get the rate. In the present case a slight change in the above procedure was made, which I think is justifiable. Here quality and quantity of mistakes both have been taken into consideration. I have not as yet found any evidence in the standard literature on the subject that such a method has been adopted by anyone.

I have already said that comprehension and speed are the major factors which influence the efficiency of reading. So in judging about the reading ability mistakes connected with them should be considered to be gravest and on the basis of this assumption the following procedure has been pursued.

Deduct, for each mistake, words from the total number of words read within the fixed time in the following way :

(i) 3 words for every deviation from the rules of punctuation.

(ii) 2 words for every mistake of the kind, omission, addition, modification and substitution.

(iii) 1 word for every wrong pronunciation, as also for those which appear to be indistinct.

Though all the items above are mistakes, a differential treatment for penalisation has been made with them, there are reasons for it. It is not proper to penalise one in the same way for committing mistakes of actually different order and strength, when there are ways by which this can be avoided. Let us take the case of punctuation, the fourth item of our instruction. It involves a high degree of comprehension, because if a subject does not pay due emphasis, pauses and intonations at proper places, will it not be logical to think that he has failed to grasp the meaning of the text, that is, will it not betray lack of comprehension ? Secondly, if he does not tax himself to understand the passage properly, he may skip over words and this mechanical method of reading may increase his speed. The

mistake of punctuation therefore which involves such important issues, is certainly graver than one of the type, omission, addition, etc., or that of pronunciation and I think everyone will agree with me on this point. For this reason largest number of words has been deducted for mistakes of punctuation. It should be remembered in this connection that comprehension and expression are very closely related to each other and so henceforward will be considered simultaneously.

Let me now illustrate by referring to a hypothetical case, how the scoring is to be actually performed. Suppose a boy has read 565 words in 2 minutes' time. Under the heads of mistakes it was found, 5 mistakes of punctuation, 6 of the kind of omission, addition, modification or substitution and 8 of pronunciation. The readings if tabulated and scored will be just like this.

Words read	Punctuation	Omission etc.	Pronunciation	Deductions	Rate
565	5	6	8		
Scoring	$5 \times 3 = 15$	$6 \times 2 = 12$	$8 \times 1 = 8$	$565 - 35 = 530/5$	106

The number of words read, that is, 565, after necessary deductions becomes 530 from which the rate of words calculated per minute becomes 106.

When the rate of reading of sufficient number of boys is obtained in this way, an average score for different age groups may then be found. The average, as we all know, is helpful as it enables us to determine the exact position of a boy regarding a particular characteristic amongst the boys of his age group. If the average alone be taken into consideration, only three judgements are possible such as, below average, average and above average. As a result the limits of judgment become very above average. As a result the limits of judgement become very narrow. For a preliminary purpose this crude scale of scoring is quite sufficient. For other purposes, however, a finer scale of judgement should be devised. This can be easily achieved if we extend the scale of judgement from a three-point to a five-point

one. Let the average be the starting-point above and below which two more points on each side are to be placed. These points can be adjusted from the maximum and minimum scores of the distribution on the assumption that the distribution is normal. Each of the five points thus achieved may be finally denoted by a range in a progressive order.

From the nature of the above discussions, one may be tempted to conclude that the test under consideration is purely a speed test. I do not refute this contention but at the same time I must say that this is not the whole truth of the matter. Unlike other speed tests, proper attention has been given here to certain other factors which play significant roles in influencing the reading ability. Questions may be raised about the validity of the procedure adopted regarding measurement of the factors, specially comprehension and expression. I have already said that comprehension and expression are closely interrelated factors. If there be lack in comprehension, expression will suffer but the reverse may not be always true. These two factors have been considered simultaneously and the provisions made for assessment of these have been already presented to you. It may be admitted that no direct method has been pursued for this assessment as is done in some comprehension tests. In these tests the testee is asked to repeat as far as possible the facts he has read and from the answer given by them the degree of comprehension is assessed. Apparently, such a procedure for direct measurement of comprehension is very practical, but a slight reflection will show that such an assumption is unjustified. Because a proper reproduction as is demanded in these tests, always involves a good memory. A testee may fail to reproduce accurately the facts he has read because of the poverty of his memory. This faulty reproduction would not justify us to conclude at once that he did comprehend the reading material at all or that he read it mechanically. As compared to tests of this type the procedure advocated here, would, I think, be considered to be more practical and reliable. Though apparently

a crude one, the principles underlying this method are certainly logical. The crudities are certainly open to modification and will, I am sure, disappear in course of time as we gain further experience and through valuable suggestions of the experts.

I have been carrying on investigation on reading ability on the lines indicated above for about one year. The data at my disposal are not sufficient and so at the present moment it is not possible for me to furnish norms of the two groups of age levels studied upon. Let me gratefully remember here that the Section of Applied Psychology, University of Calcutta, favoured me with all opportunities and privileges regarding my investigation. It is also a pleasure to me to say that the above Section has approved of my scheme for testing reading ability in her laboratory which has emboldened me in continuing my work.

CALCUTTA

PSYCHICAL PHENOMENA*

B. K. PILLAI

During my stay in the West, I have had occasion to study in detail the working of the Psychical Research Institute in England; and as the subject of my research happened to be the "Subconscious," I was automatically attracted to the study of Psychical Science which, to borrow the American term, is now called Para-Psychology. This field of Psychology is indeed very vast; and India, being a land rich in para-psychological experiences, is the right place for a scientific study of this subject. Whereas the generality of people in the West are materialists, in India, every one is something of a spiritualist; and naturally we can hope to get better results in this country.

* Read before the Psychology Section, Indian Science Congress, Baroda, 1942.

So far as we know, the field of Para-Psychology comprises of the following three divisions :—

1. Extra-sensory Phenomena, 2. Automatism; and
3. Extra-normal States.

1. *Extra-sensory Phenomena* include Telepathy, Clairvoyance, ' Psychometry ' and Mediumistic Communications.

2. *Automatism* are *Motor* and *Sensory*. Motor automatism include Automatic Writing, Planchette Writing, Dowsing and Table Tilting; and Sensory Automatism include Clairaudience Visions (Ink, Crystal, etc), Astral Journeys and Ghost Visions.

3. *Extra-normal States* include Telekinesis, Levitation, Materialisation and Yogic States.

There is no doubt that all these phenomena exist : for, after careful sifting and selection, eminent Scientists in the Psychical Research Institutes both in England and America, have collected such a volume of evidence that we are forced to believe their verdict. Had I sufficient time at my disposal I would have elaborated on each of these topics; but I hope to add only brief explanatory notes here.

Telepathy is thought-reading. It has been proved that about 4 in 100 are gifted with this faculty. Dr. Rhine in the Duke University has even shown higher results, but, others are rather sceptic about this.

Clairvoyance is seeing thing, events, etc., which are normally impossible with the help of our existing senses, and its incidence is similar to telepathy.

Psychometry is perhaps, less known than those mentioned above. For this, a gifted person touches some object, say a watch, fountain pen, etc., and describes events or objects connected with the owner.

Mediums are the liaison between the living and the dead. True mediums are very rare, usually they are only 1 in a million.

Next we come to *Automatism* : *Automatic Writing* is done when the person's attention is engaged elsewhere and when he

gives a free rein to his hand. Curious and astounding informations result out of this.

Planchette Writing is too well-known for explanation.

Dowsing is discovery of hidden minerals, water springs, etc., by means of a Y-shaped twig.

Table Tilting occurs when a group of spiritualists sit round a table; after some time, to the surprise of all, the table moves or taps are heard, subsequently by special prearranged codes, messages are spelt out.

Clairaudience is the case where a person hears voices and speeches in a mysterious manner.

Ink and Crystal Visions are very common in India. The gifted person is able to find out hidden articles, stolen goods, etc., by gazing at crystal or ink. This is called Scrying.

Astral Journeys happen when the mind is in a state of extreme abstraction; then the person feels that he has travelled to the other world and experienced strange things.

Ghost Visions as well as stories of hauntings are too familiar for any explanation. Of late, even spirit photographs have also been taken.

Coming now to the Extra-normal States—Telekinesis also known as Poltergeist, is a very peculiar occurrence which happens when certain gifted persons, usually girls in their teens, enter certain buildings and rooms. The furniture and things around her float about, and sometimes most mysteriously stones and other materials are dropped without any reason. In South India we have many such stories of this kind, though personally I have not witnessed any.

Levitation is, similar to this, but the person himself is seen floating and moving from one place to another.

Materialisation is the phenomenon in which spirits assume material shapes and present themselves to our eyes. Usually, a putty-like substance comes out of a medium's mouth and nostrils.

Yogi-m. The miracles ascribed to Yogism also form an important study in Para-Psychology.

There are several theories trying to explain the manifestations mentioned above, but still, perhaps none of them is quite satisfactory. Therefore, I think it is high time that we had a Psychical Research Institute in India. In fact I even suggested to the Psychical Research Institute in England to open a branch of theirs here; but they declined owing to lack of funds. I hope there would be more interested patrons in this country so that this occult science may develop in a soil most suited for its growth.

TRAVANCORE.

STUDIES ON THE TYPES OF INTELLIGENCE

SACHINDRA PRASAD GHOSH

Two types of Intelligence have been recognised by Thorndike and Alexander. They are concrete and abstract intelligence as measured by *Performance* and *Verbal Tests*. Concrete intelligence means intelligence involved in solving some concrete situations and abstract intelligence means intelligence displayed in the world of thoughts and ideas. Concrete intelligence is of the Performance-type; while abstract intelligence is of the verbal-type. These two types of intelligence have their objective measures. The Performance tests, Passalong, Formboard, etc., are measures of Concrete intelligence and Verbal tests including Group tests and 'L' and 'M' forms of Binet are those of abstract intelligence. The performance tests are in terms of a job to do; while the Verbal tests are in terms of words and language. The former imply things and the latter imply ideas.

To know how far these Performance and Verbal tests measure the same ability and how far they do not is a perplexing question of Psychology. Or, in other words do concrete

and abstract intelligence have any general factor and if so, what it is ; again do they involve some extra factors as well? The present study attempts to answer this question mainly. The items of tests selected for the purpose were four in number. The Passalong and Formboard tests of the Performance Group and Binet's 'L' and 'M' forms of the Verbal Group were adopted. The 'L' and 'M' forms as modified by Terman and Merrill and adapted into Bengali by the Department of Psychology, Calcutta University, were chosen. These two forms of Intelligence tests before their actual operation were applied upon numerous Bengali boys and standardised to some extent. The standardisation may not be perfect yet it is dependable. Then with these four tests we proceeded, and applied them upon 213 testees of varying ages. The number of testees were arranged according to ages into five age Groups, *viz.*, 11-12, 13-14, 15-16, 17-18, 19-20. The test scores were determined and correlations of the scores between

(I) *Passalong and Formboard* (II) *'L' and 'M'.*

(III) *Passalong and LM.* (IV) *Formboard and LM.*

were worked out as shows the table.

TABLE OF CORRELATIONS

Serial Nos.	Age groups.	No of Cases.	Passalong & Formboard.	'L' & 'M'.	Passalong & 'LM'.	Formboard & 'LM'.
1	11-12	39	423 PE .088	849 PE .018	160 PE .095	324 PE .096
2	13-14	46	485 PE .075	853 PE .040	660 PE .062	638 PE .071
3	15-16	73	340 PE .060	602 PE .061	266 PE .074	439 PE .063
4	17-18	42	360 PE .090	678 PE .056	225 PE .099	301 PE .095
5	19-20	13	545 PE .113	840 PE .065	225 PE .177	247 PE .171

N.B. The method employed was the Rank order method of co-efficient of correlation. LM is the mean of 'L' and 'M'.

The correlation between 'L' and 'M' is a marked or a substantial one, which proves that they represent almost the same tendency. The correlation between Passalong and Formboard is a low one and speaks of their small relationship. The correlation between Performance and Verbal tests still lower and their relationship is almost negligible. The correlation however is positive everywhere and it reveals one important Psychological truth. Since the correlation in no place has been a zero but a positive something, so there must exist some common factor among them. Or in other words Concrete and Abstract intelligence are not independent Psychological traits, but they belong to the same order of ability. But the amount of this ability or common factor, we do not know, and it varies differently in different tests of intelligence. From the variation of correlations in different combinations Passalong and Formboard, 'L' and 'M,' etc., we can profess that besides this common factor some specific extra factors are operating in them.

The correlation between Verbal and Verbal tests as it is high should involve some common factor called C_1 . The correlation between performance and performance tests is somewhat high and should involve the common factor C_1 + some other common factor P_1 + some specific extra factors S_1 + S_2 , etc. The low correlation between performance and verbal tests indicates that they involve the common factor C_1 + S_2 . Thus performance and verbal tests involve some common factor whether we call it Spearman's 'G' or anything else and they involve some specific factors as well.

The number of these specific factors can be determined by the method of factor analysis as advocated by Spearman and Hotelling. But it is after all, to say the least, an artificial job. Mathematical analysis can only give us an idea of the number of unit factors 'G' and 'S' involved in an intelligence pro-

blem. But it cannot describe their psychological correlates. The psychological correlates of 'G' and 'S' can be determined by analysing our reactions of intelligence psychologically by introspection. Intelligence-problems should be solved by psychological methods and not by mathematical procedure. This is the fault from which suffers Spearman's Two Factor Theory. Mathematical analysis can only supplement our psychological investigation but it cannot supplant it. So leaving aside the mathematical consideration of the problem let us consider the psychological aspects by introspective analysis.

The introspective analysis of some eminent psychologists shows that Verbal tests of Binet involve relational judgment. The performance tests both Passalong and Formboard also involve relational judgment, but in lower degree. Relational judgment operates more in Formboard than in Passalong. The keynote of solution in Formboard is logical from start to finish. The play of chance is less here. Not so subjectively speaking in Passalong. There is as strong tendency to leave things to chance and halfhazard moves. The play of chance in Passalong test can be determined by reliability test. The knots or difficult situations in Formboards require for their solution judgment that has been based upon memory, past experience, kinaesthetic imagery, training, etc. There is on the other hand one central idea in the solution of the knots in Passalong and when that is grasped nothing else remains to be done. For realising this idea past experiences, etc., are useful but a pure chance movement may give the clue. Besides this some other specific extra factors operating in performance tests. They are visualisation of form and space, eagerness for completion, interest and memory. Memory of the previous solution influences the present working in a Passalong test; while memory of the familiarity of forms influences the working of Formboard. Lastly, Passalong is dynamic in character while Formboard is static, that means in passalong there is a tendency to move without any planning while in Formboard planning guides the

movements. These are perhaps the extra factors to which the difference of correlation between Passalong and Formboard, Passalong and LM and Formboard and LM is traceable. There may be other extra factors yet unknown and they can be determined in course of time by statistical analysis and introspection.

Thus, to sum up the results from mathematical deduction and introspective analysis we can say that human abilities live in communal clusters. The verbal ability test of intelligence 'L' and 'M' function almost alike. They may rightly be called unities. The performance ability test of intelligence may also be called functional unities. Now in all of these abilities performance and verbal we have something common. Since their correlations have been positive and all of them involve relational judgement, so none of them is an independent psychological trait. But this does not prove that they are identical. They are unities only in a limited sense. They are unities in plurality. Every one of them is the resultant of more than one factor and definitely related to one another.

CALCUTTA.

RESEARCH NOTES

A NOTE ON THE LEARNING OF A 'BACKWARD' RAT

A water maze for animal learning was constructed by fixing three glass plates in a glass tank so that the rats had to dive in a 'W' pattern to go to the other side to take their food. The tank will be filled with water for the first 15 minutes at the end of which period the water is led down to three inches level. Wire spirals are put in order to facilitate the descent of the rat into the tank. If the rat does not go down by itself it will be put into the three-inch-water at the end of 20 minutes from the start of the experiment. The rat will now try to get away from water and by gradual stages will learn to go to the goal. The forward rats dive in full tank in the first three or four days. An average rat takes 15 days to learn this problem, the backward rats taking 20 to 25 days.

When a group of rats was being trained last, it was observed that one rat did not learn to dive in water even at the end of 25 days. On the 27th day, however, it was noticed that the rat dived in 11" of water (the height of the tank is 15") according to the 'W' pattern unerringly. It was observed that the rat not only dived without error, it was also diving in an unhesitating way indicating that it had learned the problem thoroughly. Though it was not diving in the first fifteen-minutes period in the full tank it was diving in almost the full tank as the water was being let down. This phenomenon evoked interest and further observations were made.

The rat has learnt the problem but it does not go in the full tank. The question arose as to why it does not dive in the full tank. The hypothesis of conditioning suggested itself. An attempt was made to find out if any extraneous factor conditioned the rat in such a manner as not to attempt diving in the full tank. As already stated at the end of 15 minutes the plug is taken off, the water is let down and a wire spiral is put to facilitate the descent of the rat into the tank. The first source of conditioning which suggested itself was this

spring. Could it be that the rat is conditioned by the presence of the spring so that it descends into the tank only when the spring is present? To test this on the 28th and 29th days, the spring was put even at the end of 10 minutes, though the usual procedure is to put it at the end of fifteen minutes. The spring was there but the rat did not dive until after the water was let down.

Thus the spring was not the factor that was conditioning the rat. The next factor thought of was duration. The water is let down at the end of 15 minutes and by the time the water comes down to about 11 or 12 inches it will be 17 minutes from the start of the observation. So on the 32nd day the spring was put at the usual time, *i.e.*, at the end of fifteen minutes but the water was let down only at the end of 20 minutes. But the rat dived only when the level of water was about 13". Similar thing happened on the 33rd day also. Thus duration had nothing to do with the diving.

The next factor of conditioning thought of was the sound. When the water is let down a big noise of the fall of water is made. The doubt arose whether it was this noise that was the conditioning factor. To test this hypothesis on the 34th day, at the end of the usual period, the water was syphoned off by means of a rubber tube without making any noise. The rat dived into the water when the level was about 13". So it was clear that the noise was not the factor that was conditioning but the decrease in the level of the water. Immediately the rat dived the syphon was removed and after allowing the rat to feed for two minutes it was put back to the starting point. The rat now dived once again in the same level of water.

Thus it was found that the factor conditioning the diving was the decrease in the level of the water. As long as the tank was full it would not dive but the moment the level was lowered it would dive in.

As already noted on the 34th day the rat was put back again and it dived for the second time on the same day. This was the first occasion on which the rat went into the water more than once. On the 35th day, *i.e.*, the next day it dived in full tank for the first time about 12 minutes after the starting of the experiment. Since it dived twice on the previous day probably it got 'accustomed' to diving in water much more than on the preceding days when it dived

only once per day. From that day onwards it was diving in the full tank two to three times a day.

If on the 27th day it was not observed that the rat was going unerringly in the partially filled tank, the chances are that the rat would have been dubbed as an 'utterly backward' rat incapable of learning this problem. By the isolation and variation of the different factors not only was it discovered that it was conditioned to the lowering of the level of water, it was also possible to make the rat go in full tank later.

The implications of this to the school and home conditions of the 'backward' child need not be stressed much. It is probable that many a boy remains backward not because his general ability is poor but because there are some factors, emotional or environmental, which hinder his success in school work. Unless he is taken up as an individual, for study, and unless the several factors are isolated and varied, we will not be in a position to help him adjust himself and grow. The need for a careful study of the backward child can never be over-emphasised. Child guidance clinics are of tremendous importance. So long as our educational ideal is of the "laissez-faire" sort—a 'pass if you can' sort, not much progress can be achieved. This neglect of the individual will tell ultimately on the level of social achievement—the progress made by any community. Unless each individual grows up to his full height the total social achievement must be affected. If the educational ideal is to see that each individual is helped to grow to his full stature and contribute his best to the social good, the needs of the 'backward' individual must be carefully studied and he must be helped to adjust himself to the environment.

Before concluding it might be briefly indicated that the causal relations in learning can be studied with great accuracy and success among the animals. Thus behaviour problems are amenable to exact study if only we take the more simple conditions. As a result of such studies we will be able in course of time to develop methods of attacking the more complex human problems.

STUDIES IN AESTHETIC PERCEPTION

The Colorimetry Committee of the American Optical Society says in a report (*Journal of Optical Society of America*, 1922, Vol. VI) that "Colour is the general name given for all sensations arising from the activity of all retina of the eye and its attached nervous mechanisms, this activity being in nearly every case of the normal individual a specific response to radiant energy of certain wave-lengths and intensity.Colour cannot be identified with or reduced to terms of any purely physical conception ; it is fundamentally a psychological category."

The preference for particular colour can sometimes be traced to associations built up in our own experience. The red and yellow are said to impress us as warm colours, because they have been associated often with the light of the Sun or the heat of the fire ; green may be said, to appear restful to the busy townsmen, because associated with the quiet place of the country and so on. We generally describe those colours as 'warm' which are found on the left side of the spectrum and the cold colours are those which are on the right side. V. Helmholtz gives the following names to the different regions of the spectrum :

Colour	Wave lengths
Extreme red	760'40
Red	686'853
Junction of red and orange	656'311
Golden yellow	589'625
Green	526'990
Cyan blue	486'164
Junction of indigo blue and violet	430'825
Limit of violet	390'879

The general stimulating effect of colour, and of some colours in particular was wonderfully demonstrated in some experiments by a French doctor, Mr. Fère, by the using of a dynamometer. He found that even the circulation of blood might be affected by the presentation of colour stimuli and that the warm colours had the most stimulating effect. In some test of colour preference among very young children, it has been found that the more stimulating the colours the more are they preferred.

W. H. Winch found that green received second preference on the average with women and first with men. As will be seen presently our results do not tally with those of Winch. The average order for 24 men and for 41 women of Mr. Winch's experiments is given below and our own results are also given for purposes of comparison :—

Mr. Winch's data		Our data	
<i>Men</i>	<i>Women</i>	<i>Men</i>	<i>Women</i>
Green	Blue	Red	Red
Blue	Green	Green	Green
Red	White	Blue	Yellow
White	Red	Chocolate	Chocolate
Yellow	Yellow	Orange	Orange
Black	Black	Yellow	Blue
		Bright Orange	Bright Orange
		Violet	Violet

Though our data obviously do not agree at all points with the statement of Dr. Fère, yet it is to be noted that there is some agreement inasmuch as red has been the most preferred colour in our experiments and violet the least preferred.

Let us now describe our experiment. The following eight colours were selected: Spectrum violet, Azo orange, Primrose yellow, Spectrum red, Ultramarine blue and Cardinal chocolate. We adopted the method of comparison, introduced by Cohn (1894) which he called the method of "*Paarweiss Vergleichung*," a phrase which has been translated as "paired comparisons," though it properly should be "pair by pair comparison."

This method of comparison involves comparing each stimulus with every other stimulus in the entire series. The total number of preferences was C_2 or 28. In order to avoid space errors all sorts of permutations were made making the total number of presentations (in pairs) 56.

Materials: 1. Card board exposure apparatus. 2. Eight colour cards. 3. Printed forms. 4. Loose papers and pencils.

Procedure: The card-board exposure apparatus was set with the wooden clamp on the table. The subjects were asked to sit before the table. They were supplied with paper and pencil to note their preferences and introspections. Colour cards were fitted according to the

serial numbers in the form.. They were exposed after two seconds after the 'ready' signal, and were kept exposed for three seconds only, after every twenty minutes the subjects had a rest period for five minutes. When the 56 comparisons were finished all the cards were laid on the table and the subjects were asked to arrange them according to the order of their own preference. No introspection was taken this time. Records thus collected were tabulated and the data treated statistically.

Direction to subject: "You are seeing two apertures on the card-board in front of you. After two seconds of the ready signal the shutter will be opened and two colours will be exposed to you for three seconds only. Just see the colours very attentively, determine which of these two colours you prefer more. Note your preference not by name of the colours but by indicating whether the preferred colour is on the right or on the left. Write your introspection. Why do you like that colour? Write whatever idea comes in your mind, don't worry about the language, spelling, expression or about decency and indecency. Just try to express yourself. You may write your introspection as long as you can. No question of time."

"Eight colours will be presented for 56 times, each time in pairs. So there will be repetition of colours, but don't worry about this. Whenever you are in any difficulty, just ask me."

Regarding the introspection of the subjects, we followed Valentine, who has classified colours according to their different aspects. These aspects of colours are four in number, illustrated by the following judgments actually given by some of the subjects:

1. *Objective aspect:* Colours found pleasing because saturated, pure and bright, or displeasing because too thin, mixed, dull, etc. Here the attention is fixed upon the colour itself and on its qualities as a colour.

2. *Physiological aspect:* The attention is drawn towards the effect of the colour upon the subject himself, particularly to its effect upon his bodily organisms, e.g., stimulating, soothing, warming, etc.

3. *Associative aspect:* With this we are already familiar. The pleasing character of a colour is determined by the things of which it reminds the subject.

4. *Character of Empathy aspect*: Here we find the colour regarded and spoken of almost as if it were a person. A character is attributed to it, e.g., jovial, sympathetic, etc.

Results: Among 112 subjects, only 68 were able to give introspection. Among these 68 subjects, 35 were of associative type, and headed the list. Next came the objective type numbering 28; then the empathy type who were 3 in number, and lastly came the physiological type, who being only 2 were least in the group.

This result is somewhat contradictory to Mr. Bullough's results according to whom the 'character' type is the largest, then comes the objective type, the associative type and last comes physiological type.

The following table shows the preferences in the free choice of the subject:—

References	I	II	III	IV	V	VI	VII	VIII
A	7.1	6.2	8.9	10.7	10.7	16.9	16.9	23.2
B	4.4	17.8	16.9	12.5	13.5	9.8	13.3	11.6
C	0.8	7.1	8.0	11.6	9.8	12.5	19.6	27.7
D	18.7	14.3	11.6	11.8	13.3	11.3	5.4	4.4
E	3.6	12.5	18.7	8.0	23.2	16.1	11.6	6.2
F	32.1	28.2	17.8	8.0	5.4	8.9	3.6	2.7
G	15.2	10.7	10.7	13.3	13.3	15.2	11.6	9.8
H	17.8	7.1	7.1	17.1	10.7	18.9	15.2	11.3

(The numerals are in per cent.)

The order of preference in the first position is as follows:

F. D. H. C. A. B. E. G.

and in the last position is as follows:

C. A. H. B. G. E. D. F.

The greatest preference for Red (F) may be due to its 'Warm' nature, and least for C & A may be due to their 'Cold' nature.

So far regarding the results of the free choice. Now in the paired comparison also we find Red (F) is preferred most.

Table follows thus :

F	Preferred	1,123	times
D	..	904	..
H	..	799	..
E	..	782	..
G	..	772	..
B	..	772	..
C	..	527	..
A	..	480	..

Total number of choice is only 6,249 instead of 6,272 ; because in the experiments 9, 10, 29, 33, subjects were unable to judge their preferences.

Psychology Department, University of Calcutta.

SASADHAR BANERJI
S. C. MITRA.

PSYCHOLOGY TO-DAY (A NOTE)

Psychology has enjoyed a healthy growth since the time it was housed in Wundt's laboratory at Leipzig. Psychology today boasts of a number of well-marked divisions of its territory. We have animal psychology, social psychology, abnormal psychology, and so on. But what is the relative strength of each type of psychology in the science of psychology as a whole ? In other words, in what proportion do psychologies contribute their share to Psychology ? The paper seeks to answer this question.

Procedure : The relative strength of different kinds of psychology has been assessed on the basis of the frequency of words connected with each type of psychology, occurring in a dictionary of psychology. This is the principle which lies behind vocabulary tests. For purposes of present investigation, H. B. English's "A Student's Dictionary of Psychological Terms" (N. Y., 1939) was used. The last word on each page of the *Dictionary* was noted. Pages 38, 39 and 40 were, however, left out of consideration, as these described in a tabular form

the various divisions of psychology, a matter which had already been discussed in a non-tabular form under the appropriate head. In this way a list of 128 words (the Dictionary having 131 pages in all) was prepared. These words were then classified as follows:

Results : Table showing the relative strength of each kind of psychology.

Kind of psychology	Total number of words referring to each	Strenght in per cent
Educational and Vocational, including statistics	25	19'5
Animal and Genetic	10	7'8
Abnormal	22	17'3
Experimental	24	18'7
General and Theoretical	28	21'8
Physiological	10	7'8
Differential	7	5'3
Social	3	1'5
Total	128	99'6

Interpretation : The results of investigation are to be taken with caution. For, in the first place, the Dictionary consulted is one meant for students. As such its primary aim is to remove the difficulties of students. Hence the selection of words may not be representative of the entire field of psychology. In the second place, the classification of words into certain categories cannot be water-tight. Certain words can legitimately belong to more than one class. With these reservations in mind, the table may be used for what it is worth.

RAJ NARAIN

Department of Philosophy, University of Lucknow.

DISCUSSION

THE CONQUEST OF FEAR

BY

NIRMAL KUMAR BOSE

One curious fact of our mental life has often surprised me. When we go through some sudden and extreme bitter experience in our life, the event comes back repeatedly to us in dreams as well as in our waking hours. We seem to lose all power to prevent its recurrence, although each such event comes back with all its attendant feelings of unpleasantness and pain which may be difficult to bear.

If the experience has been bitter and we want to avoid it then we ought to forget it quickly rather than go over it again and again within our mind. Why should there be such a compulsive rehearsal of unpleasant experiences with all its attendant suffering for the subject? I do not know what professional and experienced psychologists have to say in the matter, but as a layman an explanation has suggested itself to me which I would very much like to place before the psychologists for their valued criticism.

A sudden attack of fear unnerve us for the time being and we may run away from the situation to some position of safety; but this is certainly not conquest of fear. If, however, the desire to overcome the fear still lies within our mind in howsoever feeble a form we can only do so by an increased familiarity with the situation which has been responsible for the feeling. It may be necessary to rehearse the situation again and again in the safety of memory and thus wear down the surprise and shock of the first actual experience. We thus fortify ourselves against any possible recurrence of suitable events. It is to be borne in mind, however, that the increasing familiarity is not by itself capable of subduing the fear and transforming us into fearless persons. But it seems that increasing familiarity brought about through mental repetitions is a step in that direction.

Will we be right in saying, then, that compulsive repetition of unpleasant or painful experiences in our mental life is only a stage by

which we fortify ourselves against similar occurrences in the future ? It may be true that failures are more frequent than successes. Still, can we not regard the above phenomenon as a biological mechanism designed to preserve life ?

There is a remarkable story told in the *Majjhima Nikaya* of how the Lord Buddha overcame a feeling of fear by which he was formerly oppressed. The great master was afraid of loneliness and of remoteness from human beings in the first stage of his ascetic life. It became necessary for him, however, to live in the depths of the forest. He set about analysing the root cause of the fear that lay within him. After deep introspection he discovered that the root lay in certain 'impure' habits of the mind, and when he clearly grasped this and realized that he was free from those impurities the fear vanished from his mind and tranquillity was restored.

The conquest of fear by the intellect was thus achieved ; but the habits of old still lingered within his body. 'To stamp it out the Buddha went in the dead of night to such places of which he had been afraid. Fear immediately came upon him. He was determined to overcome the fear ; perhaps the root cause of the fear came back to his mind, and eventually the fear vanished. Every time the fear came he tried to overcome it and never sought escape from it by means of flight. In his own language the situation is thus described : "And that fear and terror came as I walked to and fro, but I neither stood still, nor sat down, nor lay down, until walking to and fro I had overcome that fear. And that fear and terror came as I stood still, but I neither walked to and fro, nor sat down, nor lay down, until standing still I had overcome that fear and terror. And that fear and terror came over me as I lay down, but I neither sat up, nor walked to and fro, until laying down I had overcome that fear and terror."

From his experience the Buddha drew the remarkable lesson that only by facing reality we can overcome fear. There are certain people who try to overcome fear by thinking that the object they are afraid of is something they need not be afraid of at all. This method is not approved by the Buddha. He called it "delighting in illusions." Fear could never be conquered that way. Fear had to be recognised as fear and then overcome.

REMARKS

I

RABI GHOSH

In the above article Mr. N. K. Bose has put forth a question which naturally came up to him in the analysis of his own experiences in relation to fear-situations. The instance he has cited from the life of Buddha is interesting. Asked by the editor of this journal to discuss the question from the psychological, especially from the psycho-analytical point of view, I humbly outline my own thoughts on the subject as follows:

The experience referred to by Mr. Bose is a common one, and is known as a traumatic experience with respect to the danger-situations. What is termed as fear in ordinary language includes, dread, fright and apprehension which are natural human reactions to danger, being differently named in psychology according to the intensity of the emotional disturbances accompanying a reaction.

According to Canon's understanding and description of human emotions, fear as an emotion has the object of safeguarding the individual against the eventuality of a danger and will subsequently lead to efforts of escaping the claws of danger by flight or warding off the object or source of danger. Canon's explanation of the series of the reactions, the first of which is the perception or intuitive appreciation of a danger is not to-day considered adequate and comprehensive of the human situation *vis-à-vis* an object or a situation of danger. Fear may be normal reaction but dread, fright, and recurrent apprehension are pathological. If the reaction of fear be evoked even when the object and the situation of danger is no longer present or likely to be present, such a reaction must defeat the biological purpose, for which, Canon would predict, fear will be evoked.

Hence, fear as evoked in the examples quoted by Mr. N. K. Bose may be regarded as pathological and as such goes beyond the pleasure-principle which Mr. Bose hinted in his paper to be a fundamental law in human nature. One shall certainly agree with Mr. Bose that the human psyche will try to avoid those experiences which are unpleasant in their emotional aspects and to efface any impression of

such an experience. To seek pleasure or to keep pain at its lowest level is a human nature. But there are occasions when human nature fails to achieve fully its goal. 'Compulsive rehearsal of unpleasant experience' therefore is a phenomenon which appears owing to the failure of the pleasure-principle, *i.e.*, an instance (not very rare though) when human nature is outlawed. But looked from another angle, a synthetic standpoint, such a phenomenon, (compulsive rehearsal of unpleasant experience in the absence of the object or situation which was the cause of first onset of pain) although very painful for the psyche, which is the locality of the occurrence of painful experience, tends to wear off the traumatic effect and to bring back the law of pleasure-pain.

Furthermore 'terror,' 'dread,' etc., do not yield to rational treatment because such reactions have in its root infantile and early experiences which (being stored in the unconscious) do not appeal to reasonable approach, reasonable in the adult sense. A child is impulsive. His reason for reaction depends upon his experience of satisfaction or of frustration. To him or to the psyche in its immature state, a situation or an object is construed as dangerous when the situation or the object leads to a deprivation or an overwhelming (too much flow of satisfaction). From the findings of and knowledge gained from our investigations into mental diseases we can make this submission that a psyche which had no traumatic experience very early in life shall not experience any terror or anxiety (anxiety is a danger-signal) in later life even if the psyche be threatened with a serious damage or destruction; and contrarily, whenever in later or adult life the psyche throws out reactions of acute anxiety or dread in a situation then such a situation also occasions the opening up an already established path between stimulation and response. Hence the reaction of fear out-weighs or out-balances the measures of the danger-situation. Because of the traversing backwards those reactions fail to yield to rational treatment.

Mr. Bose has not accepted with favour the human reaction of the avoidance of danger, as Canon would regard as naturally subserving the biological aim, but considered such reactions as surrender to fear. He would like to see a conquest of fear installed in human nature by again and again submitting to the danger-situation and

thus uprooting fear from the field of human psyche. In the quotations of the Buddha he supplies us with an example showing how to achieve the conquest of fear. About the experience of the Buddha with the worldly realities and His methods of their human treatment, I am at a disadvantage to make any remark, myself being ignorant of Buddha's life and doctrines. Discussing theoretically, I can only say, that sometimes what appears to be a facing of the reality is really a flight or a denial of reality. Our observation of physical reality is always mixed up with the presentations from the psyche and our adaptations to physical reality are spurred by our reactions to psychological reality. Describing of physical elements or measuring with physical definitions the realities surrounding us without referring to or calibrating those presentations in the psyche which are reactivated by the external events or agencies would tend to a denial of reality. The prescription which enabled the Buddha to achieve a conquest of fear can hardly be served in the dispensary of the modern world. Moreover their adoption and success will be found in the Buddha's life-history; and as a prophet's constitution and character is very different from those of a modern man, the methods of the Buddha may not produce useful results when they will be applied to man of today.

Psychology Department, University of Calcutta

II

S. K. BOSE

Mr. N. K Bose puts the question whether recurrence of unpleasant experiences originally accompanied with fear responses (1) violates the "pleasure principle," and (2) serves as a biological mechanism for allaying fear; he then cites an incident in the life of Lord Buddha to show how the latter conquered fear and puts a further question whether increased familiarity with a fearful situation leads to the abolition of fear.

While hoping that the questions will receive satisfactory answers from competent psychologists and psychoanalysts I have to hazard the following remarks in compliance with the desire of the editor.

Dr. Rabi Ghosh has argued that fear reactions evoked in the circumstances when the object or situation of danger is absent defeat the biological purpose. Such a fear, if any, is to be considered pathological and it certainly goes beyond the "pleasure principle." Dr. Ghosh points out that the compulsive rehearsal of unpleasant experiences occurs either due to the failure of the pleasure-principle, or as a means of wearing off the traumatic effect and bringing back the law of pleasure-pain in operation. He also remarks that the method adopted by the Buddha is not likely to prove successful in case of ordinary mortals. The root cause of fear lies in the unconscious and as such cannot be easily eradicated, and what in the Buddhistic method appears to be "facing the reality" is really a flight from or denial of reality.

Dr. Ghosh speaks of the inner mechanism of mind with which only a psychoanalyst is familiar. Although the psychoanalysts will probably have the last say in the matter, as a mere psychologist I think that barring pathological cases of morbid fear our commonplace reactions to fearful objects or situations can be controlled by increased familiarity with the latter. The pathological dread for snake is not likely to abate by seeing or imagining scores of snakes, but a city man afraid of snake as a dangerous creature will grow less afraid of it when he lives for sometime in a village abounding in snakes. Where exactly the line is to be drawn between ordinary fear and its pathological variety I do not know, and if Dr. Ghosh is right that all fears are pathological then familiarity with situations evoking fear would be of no avail. I am, however, inclined to think that strangeness is an important factor in contributing to fear and hence familiarity tends to diminish it. Whether through familiarity the 'ego' is 'reconstructed' to achieve the desired result is another matter the correctness of which cannot be judged here.

In ordinary analysis emotion is a "predicament" having sense of 'grip' or 'seizure.' The equilibrium of the individual concerned is disturbed and has to be restored by dissipating the energy liberated by emotions. Some emotions may be repressed in the technical sense to form complex of fear, shame, etc., that are not amenable to rational treatment. Many others that are simply suppressed demand proper adjustment. One method of diminishing emotions may be

intellectualising the situation so that we may in due course look at it from the point of view of a detached or scientific onlooker. Emotional tension may be also reduced through action. There may be another way of diminishing emotions but this rather appears to be unusual. It may be possible that we may get control over those parts of the vegetative system which are normally beyond control, thereby modifying the organic effects of disturbing situations. For example, fear leads to faster beating of hearts, and by controlling the rate somewhat (through special devices, *i.e.*, yogic practices) we may stem the forces that lead to fear.

To return to the points raised by Mr. N. K. Bose, I cannot say whether compulsive recurrence of unpleasant experiences is a biological mechanism. The question of biological utility is scarcely a psychological concern and one has to be more than a psychologist to give any opinion in the matter. Taking a commonsense view of the phenomenon of recurrence I submit that unpleasant experiences of sufficient intensity make deeper impressions, are more abiding in nature, and are liable to be easily revived when anything associated with it is touched off. The disturbing capacity of the predicament, and the strength of its grip grow less and less through repetitions and bring about mental equilibrium. It is not clear from the passage quoted by Mr N. K. Bose what procedure the Buddha adopted to conquer fear. It appears that he first realized that there were impurities in his mind and when he got rid of the impure habits of the mind by a process of intellection, the tranquillity of the mind was achieved but the fear symptoms were still retained in the body. To drive these out from the body he faced the situations that evoked the fear reactions and stage by stage caused the disappearance of the bodily symptoms. How the Buddha achieved this feat is not described in detail. I am inclined to offer the following speculative suggestion: By self-analysis the Buddha detected the root cause of fear for loneliness or remoteness from human beings, and the realization of that led to the freeing of the mind from the complexes. The psychoanalysts will say whether that is possible at all. Assuming that to be possible, let us think that Buddha still found that before a fearful situation, *e.g.*, lonely place, he was seized with fear symptoms. He now realized that he should have control over his

body, *i.e.*, over his autonomic nervous system. For that purpose he went to the situation that will evoke the fear reactions, and remaining there he subdued the bodily symptoms with the help of clear intellect, stubborn will and great physical endurance. He got control over his autonomic nervous system and the bodily symptoms of emotions vanished consequently.

Psychology Department, University of Calcutta

EDITORIAL

With the publication of this issue the journal enters into the 17th year of its existence. There would have been no need of writing an editorial had not the personnel connected with it changed. The elections of the Indian Psychological Association last year have placed the journal in my hands. I offer my sincere thanks to those who elected me to undertake this new responsibility. The successful management of a technical periodical does not rest wholly, it should be remembered, on the editor alone but depends to a considerable extent on the active co-operation of those interested in it as also on factors some of which are beyond one's control. It will be easily realised that the financial aspect is a fact of primordial importance. Fortunately for us the University of Calcutta has been very kindly continuing to shoulder the financial burden in connection with the printing of our journal and even at this time of paper shortage and high price it has not withheld the privileges which it has been extending to us since the publication of our first issue in the year 1926. On behalf of the Indian Psychological Association I tender my heartiest thanks to the authorities of the University Press. I take this opportunity to convey to Mr. D. Gangulee, B.A., the present Superintendent of the Press, our thanks and gratitude for the many suggestions with which he has helped us every now and then.

I would like to mention here some modifications which have recently been introduced regarding the administration of the journal. The journal will henceforth be edited by an editor with the assistance of another and in collaboration with the representatives of the different Universities and Educational Institutions all over India. A Council for the journal with the editor as an *ex-officio* member has been constituted. Its function is purely of an advisory nature regarding the policy to be pursued by the journal and the publication of the articles in cases where a difference of opinion arises. The names of the members of the Council and of other office-bearers of the journal appear in the third page of the cover.

We are not immediately making any drastic change in the internal arrangement of the journal. Besides a section devoted to original articles there will be one consisting of short communications and notes about original research works that are being carried on by individual workers in the field of Psychology throughout India. I take this opportunity to request all those who are engaged in such research work and who have no objection in making the nature and findings of their work known to others to communicate with us. As before abstracts of interesting and important articles from Indian and Foreign Journals and reviews and notices of books dealing with psychological and allied topics will be published in another section. Under the heading 'Discussions' we shall endeavour to publish short communications from more than one writer on a particular topic more or less in the form of a symposium. News relating to the movement of Psychology in India and abroad with comments thereon will make up another section of the journal. As before four issues of the periodical will continue to be published every year in ordinary circumstances, but they will be published in March, June, September and December instead of in January, April, July, and October which had been the custom hitherto. We shall name the issues by *Parts* henceforth and not by *numbers*.

I am confident that with the sincere goodwill and active co-operation of the Members of the Association and other well-wishers the journal will continue to thrive and maintain its standard and reputation.

S. C. MITRA

NOTES AND COMMENTS

"War," says Mr. H. D. Bhattacharyya, "has a different meaning to India from what it has to England." Quite true. We would, however, like very much to have detailed experimental and introspective studies of the average Indian individuals' psychological reactions to the war situations. Planned investigations of mass reactions are certainly possible. Psychologists in America have been helping the war efforts of the country in various capacities, some details of which have been published in the two Bulletins (Psy. Bull.,

Vol. 39, Nos. 3 and 5). Experimental studies of individuals as also of groups have been undertaken in other countries (Psy. Bull., Vol. 38, No. 6). Even submitting to the many obvious and inevitable limitations, work regarding the psychological effects of war may, we believe, still be undertaken in our country. We draw the attention of all psychologists of India to consider the matter.

* * * *

Are there war-shocked children ? Some declare that apart from the injured there are none. Miss Dorothy Macardle is definitely of opinion that those who hold such a view are wrong. What have those Indians who lived in Burma in the latter part of the last year and beginning of the present one to say about it ?

* * * *

Rumours and rumours and plenty of them every day. It is not necessary to believe them but they may be collected. How do they get circulated ? How to check them ?

* * * *

Men are in constant demand for multifarious emergency works. Misfits hinder quick work. Psychological tests are employed everywhere for quick selection of proper men. May not surer and quicker tests be devised here ?

* * * *

In connection with the last para. it gives us pleasure to mention that the Applied Psychology Section of our University has been carrying on research works of different kinds and is busy in standardizing educational and vocational tests suitable for our country. The results that they have so far been able to achieve will be found in the report annexed to this issue.

* * * *

We have received a copy of Endeavour (No 2, Vol. 1) published by Imperial Chemical Industries, London S.W. 1. It is a quarterly

review designed to record the progress of the Sciences in the service of mankind. We welcome such publications.

* * * *

We draw the attention of our readers to the description of a type of campimeter devised by Mr. M. Ganguly and reported in this journal (Vol. 14). It has been in use in the Calcutta laboratory for some years and the teachers and the students have found the instrument to be very useful.

* * * *

Mr. S. R. Dasgupta has made over to the University of Calcutta a sum of Rs. 2,000 in 3½ per cent. G. P. Notes and Rs. 70 in cash for the purpose of creating out of the interest of that sum a Gold Medal to be called 'Bhanu Dasgupta Gold Medal' in memory of his son Bhanu Dasgupta who had been a student of the Psychology Department of this University and who was drowned accidentally in the Ganges a few months back. The medal is to be awarded annually to the student who will stand first in Experimental Psychology in B.A. & B.Sc. Examinations.

* * * *

We congratulate our Secretary, Mr. S. K. Bose, on his obtaining Sir Asutosh Mookerjee Gold Medal of the Calcutta University for the second time. The thesis on the merits of which the medal was awarded to him was entitled, 'Findings of Recent Introspective Psychology and Rapprochement in Contemporary Philosophy.'

* * * *

We also present our felicitations to our Asst. Secretary, Mr. S. N. Roy, on his obtaining Jubilee Research Prize in Science of the Calcutta University. His thesis entitled 'Psychological Determinants in the Choice of Vocation' has been published by the University of Calcutta.

ABSTRACTS AND REVIEWS

ABSTRACTS

MARIA JHODA.—Some Socio-Psychological Problems of Factory Life. (*British Journal of Psychology, General Section, January, 1941.*)

The present paper discusses some social-psychological problems of factory life. To the writer a factory is not a logical construction but a social organisation. The social relationship in the factory exists in two dimensions, horizontal and vertical. The horizontal relationship means co-ordination among the workers and it is equitarian. It is best established by means of uniform dresses, sweet talks, and friendly addresses. The vertical relationship means subordination of ordinary workers to foremen and head girls, and it is 'dictatorial' in nature. The vertical relationship between the workers and the management is 'patriarchal.' The workers' unquestioned submission, feeling of respects and admiration, and appreciation of executives' personal contact illustrate their 'patriarchal' relationship; and somewhere it is altered and becomes ambivalent.

The time experience of factory girls in repetitive work is boredom. Boredom and fatigue are entirely two different experiences. Boredom mainly depends on the length of the working spell, and it is experienced when the work does not demand the full mental and physical energy of the individual. Overtime, report of the outputs hour by hour, introduction of a certain skill in repetitive work, eating sweets, general restlessness, and piece works where the girls measure time in money are some of the active escapes from boredom. Boredom varies with reference to ages. The older are bored for ever, while the younger for a period only. Lastly the social standards in the factory are something different from those in the school. The pressure of social norms in the factory is very strong and compels the girls to learn them by imitation. This learning by imitation results in producing a type and hinders the development of individuality. The social significance of marriage is

higher for the factory girls than for the middle class girls. The expectation of marrying in her twenties is a means of escape from the routine work and monotony of life. The romantic notion of love is reserved for the engagement period. The older unmarried woman on the other hand in the factory is disappointed in love and life. Her subjective adjustment is difficult and it is far more difficult for her to lead a normal social life inside the factory atmosphere.

S. P. GHOSH.

GODFREY H. THOMSON.—The Speed Factor in Performance Tests. (*British Journal of Psychology, General Section, October 1941.*)

The present article of the author is a supplement of his former work published (1940) in the *Journal of the Scottish Council for Research in Education* entitled "An Analysis of Performance Test Scores of a Representative Group of Scottish Children" in which he discussed the existence and nature of a speed factor among performance tests. In this article he reports his calculations and tentative conclusions regarding the speed factor.

The following tests according to their numbered order were given to 113 Scottish boys and 130 girls, very nearly of same age in addition to a Binet test. The tests are (1) Seguin Form Board, (2) Manikin, (3) Stutsman Picture, (4) Red Riding Hood Picture, (5) Healy Picture Completion II, (6) Knox Cube Imitation, (7) Cube Construction and (8) Kohs Block Designs. For the Seguin form board 'times' only were taken and in this test the child was incited to speed. The other tests were scored on the quality of the product. The time for each of the tests was also recorded. Since almost all the children produced perfect scores in Stutsman and a very large majority did so in Manikin, 'times' and not 'scores' for these tests were considered for the analysis of the data. For the other tests (Nos. 4-8) 'scores' were considered. Correlations between times and scores are reported to be positive with short time, *i.e.*, speed goes with high scores. During the analysis of the data he found that the Manikin scores instead of clustering with the scores of other tests clustered with the times of tests (Nos. 1-3) suggesting that the incitement factor might have persisted up to the administration of this test and died away in the cases of later tests.

None of the correlations calculated for Cube Construction 'times' with each of the variates, *i.e.*, Binet I.Q., times of tests (Nos. 1-3) and scores of tests (2 and 4-8) is at all high. It is striking that there is no correlation between Cube Construction scores and Cube Construction times. But in spite of the late position which this test had in the sequence of tests and its distance, therefore, from the incitement to speed given in test No. 1, nevertheless has some tendency to go with the other times rather than with the scores. The new variate Cube Construction times show a higher saturation with speed in the girls than in the boys, the difference being of doubtful significance. In the case of boys it might be taken as in agreement with the hypothesis that an urge to speed given in test No. 1 had died away in the later tests but hardly in that of the girls. For checking his former calculations, the consideration of Kohs Block Design data was taken up by the author at this stage and found to be of no help as this gave rise to further complications. The Kohs Block Design test consists of ten sub-tests and the custom was to stop the test if two successive sub-tests produced no score. The total times, therefore, were for varying numbers of sub-tests from two to ten and an artificial correlation is thus produced between low score and a short time which according to the aforesaid convention is a negative correlation. The correlation in the case of boys is found to be (-0.81) and in the case of girls (-0.85) . It has already been said that the Cube Construction data showed no correlation between times and scores, holding thus an intermediate position between the Manikin test on the one hand where the correlation is positive $(+0.3)$ and the Kohs test on the other, where it is negative (-0.85) . It seemed possible therefore that the Cube Construction test was an example where the true positive correlation between ability and speed was exactly balanced by a false negative correlation produced in some more insidious way than the obvious one observed in Kohs Block Designs. There are, it would seem, two influences making for short times even when the whole test is carried out by every child. The one makes one child soon get the correct or at least a very good result and the other makes another child soon satisfied with any result, even a bad one. From the fact of perfect performance it can be said that the former three tests are 'easy' and the later tests (Nos. 4-8) difficult. In the case of 'easy' tests the former of the two influences or factors is at work almost alone, and in the case of difficult

ones both factors are at work. Some children get short times because they are quick at putting the Cubes correctly into position. Others get short times because they are easily and quietly satisfied with a poor shot at the task. If this surmise is correct, it seems to follow that times can only be useful data if they are all times for performing correctly or at least nearly correctly, the task set. Times for performing a task with varying degrees of correctness spread over a wide range seem to be a complex variate of little use in practice.

D. G.

ROSS STAGNER.—Psychological Causes of War. (*Psychological Bulletin*, June 1941.)

The psychological causes of war differ to some extent from causes which are of politico-economic nature. The latter may be considered as concrete circumstances upon which emotional values are placed. Psychology determines why anyhow these emotional values come to be so fixated. Discarded concepts such as the crowd mind, herd instinct and pugnacious instinct were held before to be the causes of war. Le Bon considered that Germans and Frenchmen inherited different 'racial characters' and that each individual has a racial mind which dominates his behaviour when the nation is in peril. There is no evidence however of assuming such an inheritance difference. The present survey is based on the theoretical view-points of many competent scholars regarding causation of war.

The psycho-analytic viewpoint traces the cause of war to the libidinal and aggressive impulses which become attached to national symbols. Normally libido becomes attached to symbols of 'our' group and destructive urges to symbols of the 'out' group. According to Hopkins this is a common method of resolving the Oedipus complex, the father-image being split into a good fatherland, and a bad enemy land. Some of the qualities of the mother are also attributed to the homeland, and the 'rape' of the mother country fills patriots with indignation. Most of the analytic contributions accept this version of patriotism. Freud's inherent 'death instinct' gives rise to considerable controversy. All agree, however, regarding one point, *viz.*, that aggression occurs, that it can be displaced from immediate personal objects to social symbols, and that it could be sublimated in other ways

than through war. The best contribution is that of Durbin and Bowley, according to whom, the manner of thinking about foreign nations, is the source of conflict attitudes. Unfortunately they reject altogether the notion that political and economical factors help to cause wars. Allen finds a significant contribution to nationalism and group solidarity in sublimated homosexual impulses. Waelder has extended psycho-analytic concepts to the formation of groups. He has many important suggestions with regard to the greater violence and reduced rationality of the individual in a group situation, *e.g.*, that the national leader may take over the function of the Super-ego so that the restraining influence of taboos is lifted. The interrelationships of politico-economic and psychological factors, in the causation of war has been most thoroughly examined by Lasswell. The author moves from tariff to castration complexes and from specialists in violence to symbol-formation. Some of the formulations are undoubtedly imaginative, but later work appears to confirm what was only speculation.

Doob has applied the frustration-aggression concept to the war problem with good results. Bird gives a similar treatment with more emphasis on attitudes and measurement data. F. N. Allport offers an approach to war causation which emphasizes the concrete behaviours of individuals, acting primarily in their roles as units in the functioning of institutions. The viewpoint is a novel one.

Mention should be made of the anthropological paper by Malinowski which bears on the question of what kinds of fighting may be indulged in by groups.

Dulles' interpretation of our personified thinking about the Nation-Hero and the other-Nation-Villain (discussed also by the psycho-analysts), Stratton's idea that delusions about one nation and other nations are strongly emotionalised and Handman's argument that much of the alleged economic conflict between nations is really a question of power for national leaders, may be mentioned also in this connection.

Dunlop questions whether a new period of theological dogma in social psychology is beginning or not. It is evident that the psychologists have to face very shortly a dilemmatic situation. They will have to choose either a rigidly scientific approach to social behaviour or one biased by nationalistic, patriotic ideology. It may be concluded however that excessive patriotism is a major cause of war and that the freeing of thinking from the bonds of emotional complexes such as

nationalism is a necessary preliminary to the development of plans for permanent peace.

S. N. ROY.

H. L. ANSBACHER.—German Military Psychology. (*Psychological Bulletin*, June 1941.)

German military psychology in all its branches is dominated by a characterological approach. The most important branch is selection. The selection of officers is made by a board of psychological examiners. Objectivity is attempted by using a number of judges, who set forth their combined evaluation in a comprehensive case report.

A military psychologist, must possess certain basic requirements, such as Ph.D. in psychology, a good personality, a broad cultural background, etc. If accepted, he is admitted to three years of preparatory and probation service. Military psychology is divided into seven fields as follows: (i) Sociological psychology, dealing with the psychology of military organisation, psychological problems in connection with different military systems, different types of military activity, etc. (ii) Job-analysis and special aptitude testing: The jobs usually are aviation, automobile driving, tank-driving, radio-operation, etc. In the selection of officers personality traits receive foremost consideration. (iii) Characterological psychology of selection: It is overwhelmingly the largest part, including selection of officers. (iv) Training and Education: They are goal-directed processes. The goals are supported by ethical definitions. War is justified.

Soldierdom has been described as a mental attitude which is considered as a fundamental form of the new German culture and society. Conscription is discussed as an educational concept. Strictest discipline even at the cost of breakdown of some individuals is favoured by Dirks. Hansen favours individualized training: sergeants are actually educated along the lines of Hansen. (v) Morale, symbols and equipment: Uniforms and equipment are not only to be practical but also dignified in design and such as to make the wearer fill proud. Egotism, homesickness, queerness and homosexuality endanger the *esprit de corps* and advice is given for dealing with such cases. The positive factors are social interest and a general belief in one's value. Finally religion and the soldier are considered. Regarding the question of chance *vs.*

fate, Simoneit finds that a tendency to expect complete certainty always works against daring. In order to secure freedom and mobility of action for soldiers, there is needed a training toward respect for fate, a "higher force." (vi) Propaganda and psychology of other countries: On propaganda as such there is practically no literature. Blau's basic work on propaganda has not been made available for public. Pintschovius, in his book on morale in modern war, states that the best way to strengthen morale is to start work on this problem in peace time through the army officers and party officials, and to begin with the school child. For studying the psychology of other countries, the method followed, deals with three main aspects of a nation, (1) its origin, (2) its social, political and cultural achievements, and (3) its actions throughout its domestic and foreign history. On the basis of such information, conclusions as to what may be expected from the nation are drawn. The individuals of a nation are studied by living intimately amongst them as a friend. Knowledge of the language is indispensable. Furthermore, community studies of entire villages or industrial centres are conducted.

According to a special report the section of the psychological laboratory concerned with these matters is kept secret. "Here are trained not only the military spies but the Gestapo and party agents especially designated for service abroad."

(vii) Psychology of Combat and Conduct of War: This section includes the problem of panic. This and the minor disturbances mentioned under morale are dealt with by the military psychologists. Problem of actual war neuroses is left entirely to psychiatrists. There are methods for relaxing a state of panic and discussions regarding influence of leadership in sudden danger. The conquest of fear demands subjugation of the ego to a common ideal and the call of duty. Actual war experience liberates the ethical resources of the individual, the belief in one's own strength, the feeling of group solidarity and the sense of duty. Some observe that an individual's attitude in actual combat depends on sociological and personality factors. Another, dealing with psychological state of a soldier before capture, says that readiness for capture is produced partly through enemy propaganda which effects a reorganization of the psychological field, such that the prisoner feels no longer exclusively identified with his own cause.

The following may be considered as basic principle of selection of future officers.

(a) Scientific psychology must be combined with practical knowledge of human nature. (b) The whole personality must be considered. (c) The examination must keep closely to everyday life. The four fields of the psychological examination are intelligence analysis, action analysis, expression analysis and life history. For each of these, everyday life approach have been worked out. (d) The candidate's conduct should be observed throughout the entire examination. (e) Constitution and race must be considered. (f) The possibility of compensation must be considered. In what direction may natural aptitudes or shortcomings influence the development of the individual.

The psychological examination is conducted by a Board consisting of two officers, one physician, and three psychologists. Tests are administered mostly individually, but sometimes to a group to the limit of five only.

Intelligence analysis is conducted by suitable tests.

Action analysis: (a) Choice reaction: The following aspects are studied: power of sustained attention in presence of distractions, uniformity of reaction, choice behaviours, emotionality, introversion-extroversion. (b) Command series: In this series, will power and physical performance are particularly tested. (c) Leadership sample: Here testee has to explain the task clearly and demonstrate it. Finally he is asked to give a talk to the soldiers on some topic, and find out by questions at the end to what extent he has succeeded in making the soldiers understand the topic.

Expression analysis: Facial expressions, forms of expression in conversation and lecture, literary style and finally handwriting are the objects of study here.

Life history, Interview: In the life history, data on environmental factors, schooling, social experiences, attitude toward historical events, etc., are noted. The purpose of the interview is to obtain the candidate's point of view on his own past and future, to have him take sides on cultural matters, and to evaluate himself.

At the close of the examination period, the examiner creates harmony and endeavours to dismiss each candidate with the feeling that he has been through an important experience in his life.

REVIEWS

MYTHOLOGY OF THE SOUL.—By H. G. Baynes, M.B.
p. 940+xii. 53 illustrations. Price Rs. 32-6. (Bailliere Tindall and Cox.)

In his preface the author maintains, and perhaps rightly, that the type of mental disorder now labelled 'Schizophrenia' lies at the very roots of the psyche. Hence, to investigate it, only an introverting psychological method is suitable. The author regards Jung's analytical method as set forth in his *Psychology of Dementia Praecox* to be the only effective introverting technique in western Europe. To all who have been appalled by the seemingly insoluble riddle of the schizophrenic's mind, the author's view that psychology as a science is deeply bound up with the history of civilisation, of philosophy and of religion and, above all, with primitive mentality, will make a strong appeal. This is also Jung's view. The basic feature of this remarkable book is the study of two patients of the author, one of whom was himself a doctor. The other patient was by profession a draughtsman. Both patients were psycho-analysed but in addition to this, both were encouraged to draw whatever came into their minds. With the exception of the reproduction of three paintings by Paul Klee, a reproduction of the Taoist *Vajra-Mandala*, and the *Muladhara Chakra* from Avalon's *Serpent Power*, the 53 illustrations are all pictures drawn by the author's two patients. The author is by no means the first individual to trace out the inner experiences of schizophrenics and the same order of experiences in primitive races. Long before the advent of psychoanalysis psychologists were aware of the unexpected light which a study of early psychic stages in evolutionary development threw upon the study of dreams and functional disturbances of thought. The present work goes a long way to confirm the hypothesis that the abnormal process is a primitive process. An ardent disciple of Jung, the author would appear to think that the transformation of the libido as conceived by Jung is sufficient to explain all archaic beliefs, myths, fairy tales and the like. In everyone the magic-archaic experiences are present as the undercurrent of the waking thoughts of the day, but only in specifically schizophrenic types does this undercurrent come to active conflict with the ordinary thoughts of the understanding. In schizophrenia it is

more especially the initial states which really bring these archaic magic experiences to flower. The biological revolution of puberty often forces the disease to its first manifestation. In this period of life experiences take place which may plunge the human being into a shoreless maelstrom of uncertainty. Whether to follow his enthusiastic impulses and give himself freely to the world or to withdraw gloomily into the—self—this—and much more the author describes with meticulous precision. Every student of psychology in any of its branches cannot fail to profit by a study of the fascinating material presented to his inspection.

OWEN BERKELEY-HILL.

MANAS-SAMIKHISHAN.—By Dr. Subrit Chandra Mitra, M.A., (Cal.), D.Phil. (Liep.), F.N.I., p. 187 + xv. Price Rs. 2-0. (Ranjan Publishing House, Mohanbagan Row, Calcutta.)

This is the second book in Bengalee literature which attempts to present before its readers some facts of depth psychology, the first being *On Dreams*, written by Dr. G. Bose. The book under review, besides articles on psycho-analysis, contains a few articles on psychological problems, published elsewhere in Bengalee periodicals, an article on Sigmund Freud the founder of psycho-analysis and another on the development of psycho-analysis.

One of Freud's greatest discoveries is the fact that human beings prevent themselves from recognising the truth, although the truth is ever-present before us. Freud's greatness and his scientific ability lie in his capacity of arriving at the truth about human mind through a long persistent and painful method of encountering and then overcoming the 'resistances' in himself. It is not easy to realise the unconscious significance of behaviour nor is it in the nature of things to get such realisation. Freud discovered that the unconscious region of the mind is not merely away from the conscious but that there are devices also to keep it at a safe distance from the conscious. These devices offer great resistances when attempt is made to bring the unconscious to the level of the conscious, be it in the case of patients wanting to be cured of anomalies in behaviour through a treatment or in the case of normal people acquiring knowledge through perusal of literature.

Moreover, the knowledge of the unconscious written in a foreign literature secures for us an amount of remoteness. Dr. Mitra endeavours in this book to remove this remoteness. His choice of examples to illustrate his numerous points has greatly helped to bridge the gulf which inevitably comes into existence when we have to read the psycho-analytical findings in an alien tongue.

In this book, **समीक्षण** has been used to designate the science of psycho-analysis as well as the technique by which such a science came into existence. Suggestion is made here to reserve **समीक्षण** for the technique and to call the science **समीक्षा**. Super-ego has been translated by **अविज्ञाता**. But I would suggest that super-ego be called **प्राह** and the term **अविज्ञाता** be reserved for conscience or censor if at all the latter should be used. As regards psycho-analytical nomenclature, it can be said that Freud took many terms with descriptive significance first but later on as psycho-analytical knowledge advanced dynamic aspects became emphasised in their connotations. To-day when new words are coined or picked from common usage or rescued from oblivion to express psycho-analytical thoughts and ideas, they should be so dressed as to keep their toes to the line of modern psycho-analytical thinking.

Unlike other psychologies, effective psycho-analytical understanding can hardly be realised through the intellectual grasp alone. To his readers Dr. Mitra has given many indications of the ways of his own understanding which I am sure would be of immense help to the readers of this book.

RABI GHOSH.

GROUP PSYCHOTHERAPY. -By J. Bierer, British Medical Journal, February 11, 1942.

In this paper Dr. Bierer describes in brief his newly discovered methods for the treatment of mental patients. Psycho-analysis appeared to him as impracticable because of its three disadvantages: the patient is kept in a state of reduced activity; the patient is unable to be independent; and the type of patients suitable for that treatment is

limited in number. His method on the other hand has the following advantages to its credit: shortening of the time; combined usage of Individual and Group treatment; introducing a method of Situational treatment and new forms of Social treatment keeping no gap between insight and cure.

In one year he claimed to have treated 70 neurotic and psychotic patients with his methods in a mental hospital in England, 87 per cent. of whom were discharged cured or improved. "This was effected" he says "by using a short form of analysis, by a combination of individual and group treatment, and by introducing a method of 'situational treatment' and a new form of social treatment." The Situational Treatment consists in affording a change of the situation so that the patient through experiencing is able to bring about an alteration in his attitude to reality. His Social Treatment is provided through the Social Club which has its basis in that nothing is arranged for the patients but everything is arranged and governed by them. Experiments in Group Psychotherapy have been classified as follows: Mass Treatment overpowering many people by mass hypnosis (A. Brauchle—1927, *Selbstinflus.*, 22, 283); Class Treatment—convincing people by teaching, lecturing (R. W. Buck—1937, *Ann. Intern. Med.*, 11, 514); and Collective Treatment aiming at more than superficial overpowering or teaching by Group Psycho-analysis (Schilder—1939, *Ment. Hyg.*, 37, 87), by Group-activity (L. C. Marsh—1931, *Ment. Hyg.*, 15, 378), by Collective Living Together (W. R. P. Emerson—1910, *Boston Med. Surg. J.*, 163, 326), by Situational treatment (J. Bierer—1910, *Ment. Sci.*, 86, 287).

Had the author included some detailed case-history and the course of treatment in this paper it would have been easy for the readers to judge the merits of his treatment.

I would like to refer our readers to Glover's classification of Mental Diseases and to Sigmund Freud's Analysis Terminable and Intermittent (*Int. J. Ps.*, Oct., 1937) for discussions on the advantages and disadvantages of the psycho-analytical standpoint in curing mental diseases. It is certainly relieving to hear about some inventions of psychotherapeutical methods for helping mental patients even though that help be nothing more than temporary amelioration of their suffering.

INDIAN PSYCHOLOGICAL ASSOCIATION

PROCEEDINGS OF THE GENERAL MEETING HELD ON THE 24TH FEBRUARY, 1942

The annual meeting of the Indian Psychological Association could not be held at Baroda during the Science Congress week in January as most of the members and office-bearers could not attend on account of the unusual condition then prevailing in the country. The election was duly held in December, 1941, by ballot according to the Statutes of the Association, and the new Executive Committee held a meeting on the 3rd February, 1942, and fixed the date for the General Meeting on the 24th February, 1942, in Calcutta. The results of election were circulated to the members.

The General Meeting was held on the 24th February at 2 P.M. in the Laboratory of Psychology, 92, Upper Circular Road, Calcutta, with Prof. G. Bose, D.Sc., M.B., in the chair. Sixteen members and two student members were present.

The recommendations of the Executive Committee and the suggestions received from several members were considered and the following resolutions were passed:—

1. Resolved that Mr. N. S. N. Sastry be elected a member of the Executive Committee in place of Dr. S. C. Mitra who had been elected Editor of the Journal and was therefore an *ex-officio* member of the Executive Committee.

2. Resolved that Dr. G. Pal be elected a member of the Executive Committee in place of Prof. G. Bose who desired to be relieved on account of his multifarious duties elsewhere and who assured the Association of his help whenever necessary.

3. Resolved that Mr. J. M. Sen be elected the President of the Association in place of Mr. H. P. Maiti who had resigned for some private and personal reasons.

4. Resolved that Dr. G. Pal be elected a Vice-President in place of Mr. J. M. Sen who was elected the President.

5. Resolved that in the Statutes of the Indian Psychological Association in rule 22 under the head 'Journal' the following be inserted in place of "There shall be a board of four editors.....from Bengal."

"There shall be an Editor elected by the Executive Committee. The University of Calcutta having undertaken to meet the cost of publication of the Indian Journal of Psychology, the official organ of the Association, the Editor shall be one connected with the University of Calcutta. There shall be an Assistant Editor appointed by the Executive Committee. The Indian Journal of Psychology shall be published by the editor with the assistance of the asst. editor and in collaboration with fifteen members representing different universities or educational centres. There shall also be a Council of the Journal with three members and the Editor as an

ex-officio member. The collaborating Editors and the members of the Council will be appointed by the Executive Committee. The function of the Council will be mainly advisory regarding the policy of the Journal.'

6. Resolved that the following be appointed collaborating editors: (Miss) K. H. Cama, Mr. Rangin C. Halder, Mr. M. Asham, Mr. K. C. Mukherji, Mr. Kali Prasad, Mr. Pansram, Mr. K. L. Shrinani, Mr. P. S. Naidu, Mr. E. W. Franklin, Mr. T. K. N. Menon, Dr. P. T. Raju, Mr. S. R. Bose, Mr. M. Mukhdum, Mr. R. M. Loomba and Dr. N. P. Mukerji.

7. Resolved that Dr. R. Ghosh be appointed Assistant Editor for 1942-44.

8. Resolved that the following be appointed members of the Council of Journal: Prof. G. Bose, Mr. N. S. N. Sastry, Mr. M. N. Banerji.

9. Resolved that under rule 13 of the Statutes of the Association the following two be appointed officers to help the Secretary in his office work: Mr. S. C. Sinha and Mr. S. N. Roy. Resolved further that Mr. Sinha be requested to act as the treasurer and Mr. Roy be requested to act as the assistant secretary.

11. To expedite the publication of the 1941 issues of the Journal the General Meeting authorised the new editor Dr. S. C. Mitra to enter into communication with the past editor, Mr. H. P. Maiti, and take the necessary steps to publish the 1941 issues at the earliest possible date. On account of the shifting of the University Press to a new building and the sad bereavement of Mr. Maiti the Journal could not be published in 1941.

12. The General Meeting considered Mr. Maiti's objection that the new Executive Committee could not come into active function as the annual meeting was not held in January. Mr. Maiti wrote a letter to the new Secretary that though according to the statutes the results of election are only to be announced in the Annual Meeting and not confirmed, yet he was of opinion that the new Executive Committee was unconstitutional.

It was ordered to be recorded.

G. BOSE,

Chairman.

S. K. BOSE,

Secretary.

The following is the list of office-bearers for 1942-44.

PRESIDENT

Mr. J. M. Sen, B.Sc., M.Ed. (Leeds), T.D., F.R.G.S., F.N.L.,
Principal, Krishnagar College, Krishnagar, Bengal.

VICE-PRESIDENTS

Dr. I. Latif, M.A., Ph.D., Head of the Department of Psychology,
Foreman Christian College, Lahore.

Dr. G. Pal, D.Sc., Lecturer in Psychology, Calcutta University.

EDITOR

Dr. S. C. Mitra, M.A., D.Phil. (Leip.), F.N.L., Lecturer in Psychology, Calcutta University.

LIST OF MEMBERS

LIFE MEMBER

Bose, G., D.Sc., M.B., F.N.I., Psychology Department, University of Calcutta.

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- Alawi, A. H. J., M.A., Training College, Kabul.
 Aslam, M., M.A. (Cantab.), Government College, Lahore.
 Atreya, B. L., M.A., D.Litt., Hindu University, Benares.
 Banerji, M. N., M.Sc., B.L., Psychology Department, University of Calcutta.
 Banerji, S., B.A., 9 2B, Palit Street, Calcutta.
 Berkeley-Hill, O., M.A., M.D., I.M.S. (Retd.), Ranchi Nursing Home, Station Road, Ranchi.
 Bhattacharyya, H. D., M.A., B.L., P.R.S., Philosophy Department, University of Dacca.
 Basu, A. N., M.A., T.D. (Lond.), Teachers' Training Department University of Calcutta.
 Bose, S. K., M.Sc., M.A., Psychology Department, University of Calcutta.
 Bose, S. R., M.Sc., Teachers' Training College, Corporation of Calcutta.
 Cama, K. H. (Miss), M.A., M.Sc., Ph.D., The Sir Dorabji Graduate School of Social Work, Bombay.
 Chatterji, B. B., M.Sc., M.B., Psychology Department, University of Calcutta.
 Datta, A., M.Sc., B.L., Psychology Department, University of Calcutta.
 Deb, S. (Mrs.), M.A., T.D., Psychology Department, University of Calcutta.
 Dey, R. K., M.Sc., 17, Ramakanta Sen Lane, Calcutta.
 Fleming, A., Johannesburg, South Africa.
 Franklin, F. W., M.A., T.D., Spence Training College, Jubbulpore.
 Ganguly, D., M.Sc., Applied Psychology Section, University of Calcutta.
 Ganguly, M., M.Sc., B.L., Psychology Department, University of Calcutta.
 Ghandy, J. J., Tata Steel and Iron Works, Jamshedpur.
 Ghosh, B. C., M.A., M.B., B.C. (Cantab.), Psychology Department, University of Calcutta.
 Ghosh, M. N., M.A., Terasri, Dacca.
 Ghosh, Rabi, M.Sc., Ph.D. (Lond.), Applied Psychology Section, University of Calcutta.
 Ghosh, R. (Miss), M.A., Gokhale Memorial College, Calcutta.
 Ghosh, S. (Miss), M.A., Hindu Female Government Training School, Calcutta.
 Ghosh, S. P., M.A., Applied Psychology Section, University of Calcutta.
 Jacob, L. (Mrs.), 2, Albert Road, Calcutta.
 Julota, S., M.A., D. A. V. College, Sholapur.

- Latif, I., M.A., Ph.D., F. C. College, Lahore.
- Loomba, R. M., M.A., Ramjas College, Delhi.
- Maiti, H. P., M.A., Psychology Department, University of Calcutta.
- Maitra, R., M.A., Rajshahi, Bengal.
- Menon, C. N., M.A., Ph.D., Hindu University, Benares.
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- Mitra, S. C., M.A., D.Phil. (Leip.), F.N.I., Psychology Department University of Calcutta.
- Mookerji, K. C., M.Sc., Vidyasagar College, Calcutta.
- Mukerji, N. P., M.Sc., Ph.D. (Lond.), Teachers' Training Department, University of Calcutta.
- Mukherji, K. C., M.A., P.R.S., Philosophy Department, University of Dacca.
- Mukhdum, M., M.A., Philosophy Department, Muslim University, Aligarh.
- Naidu, P. S., M.A., Philosophy Department, University of Allahabad.
- Pal, Gopeswar, D.Sc., Psychology Department, University of Calcutta.
- Parsrami, M.A., F. C. College, Lahore.
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- Roy, S. N., M.Sc., Applied Psychology Section, University of Calcutta.
- Samanta, M. N., M.Sc., Psychology Department, University of Calcutta.
- Sastri, N. S. N., M.A., Psychology Department, University of Mysore.
- Sengupta, N. N., M.A., Ph.D. (Harvard), Philosophy Department, University of Lucknow.
- Sen, J. M., M.Ed. (Leeds), F.R.G.S., F.N.I., Krishnagar College, Krishnagar.
- Sen, Indra, M.A., Ph.D., Hindu College, Delhi.
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- Sinha, C. P. N., M.A., C.I.E., 4, Club Road, Muzaffarpur.
- Sinha, T. C., 38, South End Park, Calcutta.
- Sinha, S. C., M.Sc., Psychology Department, University of Calcutta.
- Srimali, K. L., M.A., B.T., Vidya-Bhavan, Udaipur.
- Vicary, T. C. (Rev.), M.A., United Mission Church, Berhampur.

STUDENT MEMBERS

- Bisi, A. C., B.Sc.
- Guha, U. (Mrs.), B.Sc.
- Gupta, K. P., B.A.
- Ganguli, N., B.Sc.
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- Bokil, K. (Miss), B.A., B.T.
- Campbell, N. K., B.A.

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FOREWARD

The present report of the Applied Section of the Department of Psychology has been drawn up mainly with the view to supplying the guardians of students and the members of the teaching profession with the necessary information in connection with vocational guidance. A perusal of the report will enable the reader to follow easily the line of work that is being carried on and the efforts that are being made by the Calcutta University to put vocational guidance on a firm footing.

The Applied Section has been the first in the field in India to conduct vocational guidance in a systematic manner. The work will take a long time yet to be put on a standard basis. Although the technical aspect of the work has not been dealt within any detail in this report the expert will find many things in it to interest him. Certain suggestions have been made in the report for providing facilities for the training of a sufficient number of suitable persons so that the work may be extended and proper standardization of the vocational tests may be more quickly achieved.

Besides vocational guidance proper the Applied Section has also been investigating other psychological problems indirectly associated with it. Brief mention of such work will also be found in the report.

Dated the 1st. May, 1942
University College of Science
92, Upper Circular Road
Calcutta

G. BOSE, D.Sc., M.B.
University Professor of Psychology
and Head of the Department
University of Calcutta.

**Report on the working of the
Applied Section of the Department of Psychology
Calcutta University**

[*From the beginning to the 31st March 1942*]

The success achieved by some of the institutions of applied psychology in Great Britain, France, Germany, Russia and America has proved beyond doubt that the young science of psychology is of great practical utility in ordinary daily life. The need of making psychological knowledge available and useful to the people of our country was felt by the Bengal group of psychologists years back. A proposal was made in 1922 by a few members of the Department of Experimental Psychology, Calcutta University, for taking steps so that the study of Applied Psychology in the University may be undertaken and encouraged. Subsequently a scheme for the establishment of an Indian Institute of Applied Psychology under the auspices of the University was prepared by Mr. M. N. Banerji in consultation with Dr. G. Bose and submitted to the University authorities in 1933. Nothing, however, could be done at that time.

India's pressing need of an Institute of Applied Psychology was emphasised by Mr. M. N. Banerji in his presidential address before the Section of Psychology of the Indian Science Congress held in Bombay in January 1934. Reports of certain preliminary investigations in the field of Industrial Psychology that had been carried out by Mr. Banerji and his associates in 1933 at the factories of Bengal Chemical and Pharmaceutical Works Ltd., Calcutta and of Tata Iron *

& Steel Works Ltd., Jamshedpur were read before that session of the Science Congress. This field work was the first of its kind in India.

In January 1935 before the session of the Indian Science Congress in Calcutta, Dr. S. C. Mitra emphasised in his presidential address, the need of devising ways and means for applying the knowledge of psychology to actual problems of life and formulated some concrete proposals for collecting data regarding the intelligence factor of Bengali school children. It will thus be realized that the importance of standardizing a battery of tests in Bengali suitable for industrial and educational purposes was being emphasised by the Department of Psychology for several years past.

In 1936 the University of Calcutta sanctioned the post of a research scholar to work under Dr. G. Bose for the purpose of standardizing an intelligence group test suitable for Bengali children. In that year the Sectional Committee of the Psychology Section of the Indian Science Congress Association passed a resolution requesting the Executive Committee of the Association to consider the feasibility of starting an All-India Institute of Applied Psychology. In pursuance of that resolution the Executive Committee appointed a Sub-Committee with Dr. G. Bose as convener to go into the question. The Sub-Committee drafted a constitution of the proposed institution and circulated it on the 12th December 1937, to the heads of the different Universities, Railways and Commercial firms inviting their opinion and co-operation. As the response received was not very encouraging the Sub-Committee in its meeting on the 7th January 1938 held in the Laboratory of Psychology, University College of Science, Calcutta, decided to drop the idea of having an All-India Institute and suggested that the different provinces might start work in the field of industrial and vocational psychology under the auspices of their respective universities. Dr. C. S. Myers, the then Principal of the National Institute of Industrial Psychology, England, who came to Calcutta as a delegate to the Silver Jubilee Session of the Indian Science Congress in 1938, attended the meeting and took part in the deliberations.

With the end in view of carrying investigations in the fields of industrial and educational psychology the department had been purchasing certain apparatus and test materials out of special grants by the University from the year 1934 and by the end of the session of 1937-38 articles worth over Rs. 4500/- were secured.

The establishment of the present Applied Section of the Department of Psychology was possible only through the active interest of Dr. C. S. Myers, and through the encouraging support given by Mr. (now Hon'ble Dr.) Syamaprasad Mookerjee, the then Vice-Chancellor of this University. Dr. Bose prepared a detailed scheme in consultation with his colleagues and submitted it formally to the University on the 4th April 1938 (Appendix A). The scheme could not at that time be sanctioned in its entirety. A part of it was, however, sanctioned by the Senate in its meeting dated 18.6.38. (Appendix B). This brought the present Applied Psychology Section into existence and Mr. M. N. Banerji, senior lecturer of the Department of Psychology, was put in charge of the working of the Section. The Section began to function actually from about the 1st week of September 1938. It was decided that of all possible fields where psychological knowledge may be fruitfully applied, only vocational guidance to school leaving children of Bengal should at present be the immediate concern of this Section.

The newly constituted Applied Section therefore engaged itself in selecting, after careful scrutiny and trial, tests from amongst those employed by psychologists in different parts of the world. The tests finally adopted by the Section are given here.

Nature of tests	Name of Tests	Component of tests	Average time required for each test	
			Hr.	Mts.
I. Intelligence	(1) Departmental group	185 Qs.	0	45*
	(2) Spearman group	168 Qs.	0	45*
	(3) Terman-L	10 A.L.	1	40
	(4) Terman-M	10 A.L.	1	10
II. Performance	(1) Passalong	9	0	45
	(2) Cube construction	8	0	25
	(3) Formboard	4	0	80
	(4) Maze	7	0	25
	(5) Block Design	10	0	45
III. Special Ability	(1) Mechanical	10	0	45
	(2) Manual	8	0	80
	(3) Constructional	1 set	0	45
	(4) Dexterity	8	0	45
	(5) Drawing	From memory	0	10
IV. Scholastic	(1) Reading	}	0	45
	(2) Dictation			
	(3) Arithmetic			
V. Temperament	(1) Subjective paired Qs.	30 Qs.	2	80
	(2) Qs. On mental constitution	64 Qs.		
	(3) Extravert-Introvert	50 Qs.		
	(4) Word Association	100 Wds.		
VI. Psychological	(1) Fatigue	}	0	45
	(2) Reaction time			
	(3) Memory			
	(4) Steadiness			
VII. Medical Examination			0	20
VIII. Interview with testee and objective estimate			0	45
			13	40

(Say 14 hours).

Qs. stands for Questions. A.L. stands for Age Level. Wds. stands for Words.

* Of the tests mentioned above, the Departmental and Spearman group tests are outside the regular vocational test programme and are applied for separate investigation.

The completion of all the tests for each boy requires about 14 hours.

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Vocational guidance is new to India and many difficulties had to be removed before a regular plan of work could be settled. The nature of these difficulties and the way they

were sought to be overcome will be best understood by studying the detailed procedure that was employed by the Applied Section in this connection. It may be mentioned that such procedure is adopted in other countries also.



CONSTRUCTION ABILITY TEST

To find out the most suitable vocation for a particular candidate it is necessary to know all sorts of details regarding the mental and the physical constitution of the person concerned. For this purpose many elaborate tests are administered and the results carefully noted. For instance, the candidate is medically examined to find out whether he can stand hard

work, whether he is more fitted for indoor or for outdoor work, whether he has any susceptibility to any occupational disease, whether his eye-sight is good, whether he has any colour blindness which is a bar to certain vocations, whether his hearing is good, and so on. It has to be further determined whether the candidate has any predisposition to any nervous disorder, whether he is temperamentally fit for the vocation recommended for him, whether he has any emotional drawback, etc. Special tests have to be administered to determine the temperamental and the nervous constitution of the candidate. Another group of tests designed to find out special aptitudes have also to be given to the candidate. These tests enable the psychologists to find out whether the candidate can be recommended for a work requiring mechanical ingenuity or some special performance ability and so on. Certain candidates are unfit for work of a monotonous and stereotyped nature. Certain others are unfit to act in positions requiring executive ability. All these have to be found out by special tests. Then again the general intelligence level of the subject has to be determined. The intelligence level of the candidate serves as an extremely useful guide in recommending certain types of profession. When all these tests are finished the candidate has to meet an expert interviewer. The subject's special predilections, his general bearing and many other factors of importance are carefully considered by the interviewer. It is to be noted that the motives that are responsible for the choice of a particular vocation by a particular individual as also the factors that go to make a person successful in his vocation are not all of them conscious. Direct questioning gives but imperfect knowledge of the mental constitution of the candidate. Besides trying to ascertain the conscious factors the interviewer attempts his best to get also at the unconscious determining elements that are responsible for success or failure in any particular vocation. Finally the candidate's guardian has to be interviewed. His social position, heredity and the available vocational facilities have to be investigated. After all these facts have been collected and due consideration has been given

to them vocational advice is administered. The function of the vocational adviser does not however cease with the mere giving of the advice. The future career of the candidate should be followed up and it should be determined how far the judgement of the adviser has been correct. If deviations



PASSALONG TEST

are found, their source should be carefully traced and remedial measures adopted to prevent their recurrence. Thus, whether the vocational advice has been worth while or not can only be found out several years after the candidate has actually taken up the recommended occupation and has settled down in life.

The devising and the administration of the tests of the different types mentioned above and their proper appraisal bristled with innumerable difficulties. There were pitfalls in every direction that had to be avoided. The selected tests could not be used as they were. They had to be translated into Bengali and modified to suit local conditions. This was an arduous work as careful attention had to be paid to maintain in the translated version the psychological values of the original items. This work consumed much time. The total number of items translated and modified was well over 1000. The Bengali versions of the different tests were printed and manuals of directions for conducting the tests were prepared.

Mere administration of tests and their scoring are not sufficient. We must know what each score really signifies. In order to be able to determine this we must have a record of what is called the normal performance and of the range of variations from the normal. No vocational advice could be given for some time even after the testing was in progress as we had to wait till tentative norms were obtained for the different items. At this point another difficulty cropped up. Some of the tests did not give the expected uniform results under similar conditions. They had to be discarded or further modified. The following is the list of tests, at present in use by the Section.

1. Intelligence :

- | | |
|-------------|-----------------------------|
| A. Abstract | i. Terman & Merrill Form L |
| | ii. Terman & Merrill Form M |
| B. Concrete | i. Passalong |
| | ii. Formboard |
| | iii. Cube Construction |
| | iv. Block Design |

2. Special Abilities

- i. Mechanical-Stenquist
- ii. Manual-Crochet
- iii. Dexterity-Cox
- iv. Constructional-Kelly

3. Temperament

- i) Subjective paired questions
- ii) Extravert-Introvert
- iii) Word Association
- iv) Neurotic Questionnaire

- 4. Scholastic Ability : Reading
- 5. Psychological Trait Reaction time
- 6. Physical Traits
- 7. Interview with the candidate

The description of these tests is given in Appendix C

Difficulties of the sort mentioned above are however inevitable in vocational testing and had to be faced in other countries as well before standardization was achieved. Although we have now got tentative norms for most of the tests, proper standardization has to wait for a long yet.

At the first stage of our work, the administration of the large number of tests to a person used to consume more than 14 hours' time. The reduction of the number of tests effected a saving of 2 hours' time in each case. The total time taken for the application of the whole battery of tests to a candidate is now 12 hours. The school authorities could only be persuaded with great difficulty to allow their students' class work to be interrupted for such a long period. Even with the consent of the school authorities the testing work could only proceed slowly. We have now been able to effect a further saving in time by a proper planning of the tests keeping in view the statistical requirements. Prof. Rajchandra Bose of the Mathematics Department has given us valuable advice and direction in this connection. We have brought down the period of testing hours for each candidate to 8. This does not include the time for the interview of the student's guardian. Later on we hope to curtail this time still further. The plan of work is given in Appendix D. After sufficient data have been collected and proper standardization becomes possible some of the tests we have now been employing may be omitted from the battery.

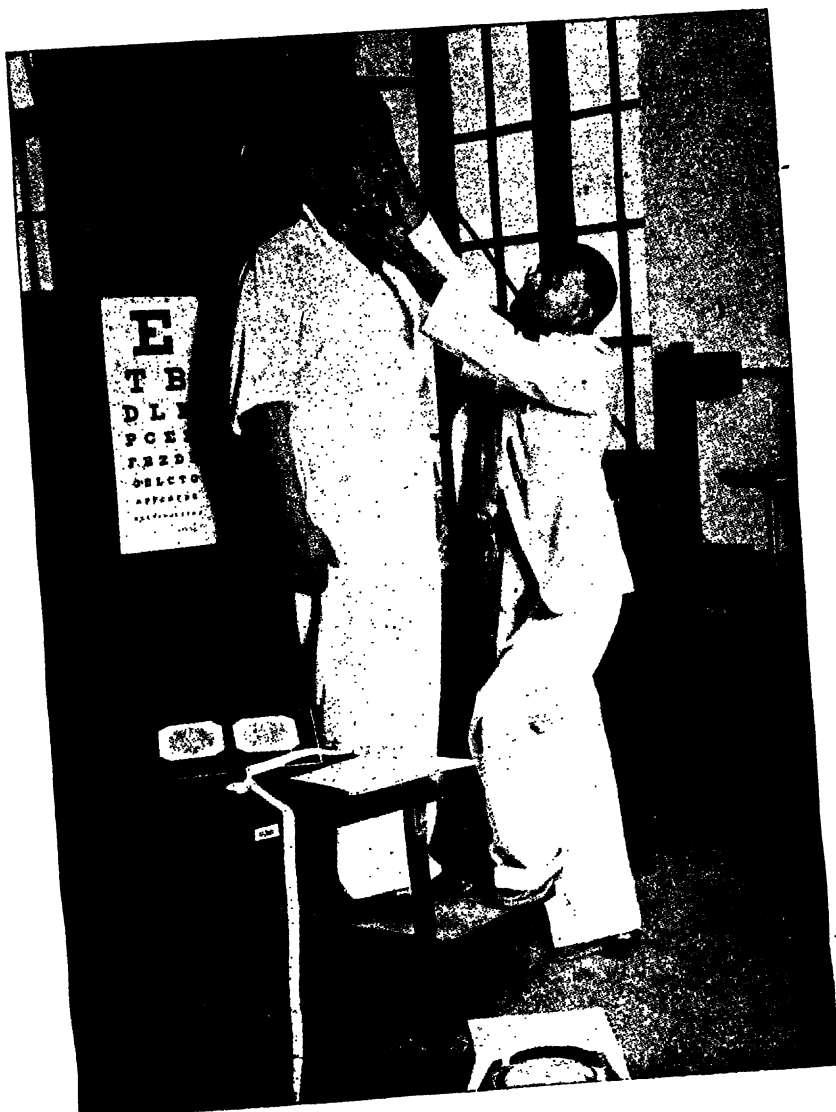
Out of 460 cases under the head vocational tests and guidance given in the table in page 12, 280 are students of three different schools of Calcutta ; they were tested on their respective school premises under the usual conditions of school life. The authorities, the head masters and the teachers of the different schools where vocational testings were conducted by the Section deserve our best thanks for their ready co-operation and valued help without which the conduction of such tests in schools would have been impossible. The table shows the number of cases tested in different schools.

Monohar Academy, Belgachia	143 (All the tests given (29-3-39 to 5-3-40)	on page 4 were adminis- tered.)
Mitra Institution (Main) Harrison Road (1-4-40 to 3-4-41)	... 118 (The plan of work given in Appendix D be- gan at this stage and the first series of tests was applied.)	
Rani Bhabani School D. L. Roy Street (4-8-41 to 4-9-41)	... 19 (The second series of tests according to plan was applied here.)	

The work at Rani Bhabani School continued up to the first week of September 1941 when the school testing had to be postponed owing to terminal examinations and Puja vacation. It was arranged with the authorities of the school to commence testing on the school premises again by the 2nd week of January 1942. Unfortunately owing to the emergency situation cropping up in the meantime in Calcutta the whole programme has been upset and the testing of the school children has to be discontinued for the present.

When students from schools are not available for carrying on tests, as for example during vacations, the Section invites applications through the press from persons who would like to have themselves tested for vocational guidance. This testing is held in the Laboratory free of cost. The Section received a fair response and a heterogenous group of 180 persons of

varying ages have been tested up to the present moment.
The testees had to come to the laboratory for three



PHYSICAL EXAMINATION

consecutive working days and all the tests (list given in
pages 8-9) were applied.

Besides vocational testing other tests of psychological importance are also conducted by the Applied Section.

A table showing the total number of cases, under each type of testing is given here. The departmental intelligence test and clinical guidance had already been in progress when the Applied Section started its work.

Items	Number of cases disposed of.
Departmental Intelligence Test	3000
Preference Tests	2500
Vocational Tests and Guidance	460
Clinical Guidance	250
Intelligence testing according to Terman & Merrill, L and M forms for lower age group	135

Although at first sight the number of cases disposed of during the last three years and a half may not appear to be large it would be a mistake to judge of the achievements of the Applied Section merely by the number of cases turned out so far. The huge amount of labour that had to be necessarily gone through before we were in a position to offer vocational guidance, details of which have already been given, should be taken into account in appraising the work performed by the section. If this be done we do not think that there will be any ground for diffidence on this score.

Though the data obtained up to the present moment do not warrant any definite and convincing conclusions still an attempt is made in the following pages to make a tentative presentation.

Summary of Findings

A. Vocational Guidance

The tests that have been described are administered by the Section to every testee. His class standing is ascertained from his school report. His guardian is interviewed for



INDIVIDUAL INTELLIGENCE TEST

eliciting information as to his heredity, family environment and economic condition. His test results are scored to

determine his intelligence level, performance ability, aptitude for special lines and personality traits. His physical condition is also found out. The advice that is given as to the suitable future career or the most profitable line of training for the testee is based on a consideration of all the facts thus collected. Up to now 460 cases have been tested and vocational and educational guidance has been given to 415 cases and the remaining 45 cases have been partially treated and the data so obtained have been utilised in standardizing the tests.

For the purpose of recommendation the following vocations have been taken into consideration :

SERVICE

- Class I** Imperial and Superior Central Services (recruitment by competitive examinations), *e.g.*, Indian Civil Service, Indian Audit and Accounts Service, Imperial Customs Service, Indian Railway Accounts Service, Military Accounts Service, Postal Superintendents—Class II, Transportation ('Traffic) and Commercial Departments of the Superior Revenue Establishments of State Railways, Survey of India—Class II, Indian Police Service, Indian Forest Service, Indian Military Academy—Dehra Dun, Royal Indian Navy, Royal Air Force College—Cranwell, etc.
- Class II** Provincial Government Services (recruitment by competitive examinations), *e.g.*, Bengal Civil Service (both Judicial and Executive), Bengal Forest Service, Bengal Police Service, Bengal Excise Service, etc.
- Class III** Ministerial Services—1st and 2nd Divisions (recruitment by competitive examinations and nominations), *e.g.*, persons who ultimately become Superintendents, Office Masters, Supervisors, Personal Assis-

tants to Higher Officers, etc., and High Executives in Bank, etc.

- Class IV Typists and routine grade clerkship, *e. g.*, Clerks in Government Offices and Secretariates, Clerks in Railway Offices, Merchant Offices, etc., including Lower Division Clerks in the Indian Army Corps (Civilians)

ENGINEERING

- Class I Civil, Military, Mechanical, Electrical, Chemical, Mining, etc.
 Class II Ground Engineering (Aviation), Automobile Engineering, Radio Engineering and Radio Technology, Press and Printing Export, etc.
 Class III Overseer, Foreman, Surveyor, Draftsman, Electrical Overseer, etc.
 Class IV Skilled and Semi-skilled Labour—Mechanic, Fitter, Electrician, Rivetor, Automatic Machine Worker, Telegraphist, Compositor, Driver (*e.g.*, Motor, Tram, Railway, etc.), etc.

LAW

- Class I Barrister, Advocate, Pleader
 Class II Solicitor and Attorney
 Class III Muktear

ACTUARIAL WORK & ACCOUNTANCY

- Class I Actuary
 Class II Chartered or Incorporated Accountant, R. A., etc.
 Class III Government or P. W. D. Accountant, Local or District Board Accountant, etc.

MEDICINE

- Class I Graduate in Medicine and Surgery, *e.g.*, M.D., M.B., M. B. B. S., M. S., M. O., etc.
 Class II Licentiate in Medicine and Surgery, *e.g.*, L. M. F., L. M. P., etc.
 Class III Midwife and Nurse, Compounder, etc.

TEACHING

- Class I College Teacher (in Arts and Science)
 Class II Specialist Teacher *e.g.*, Kindergarten, etc.
 Class III High School Teacher
 Class IV Primary School Teacher

JOURNALISM

- Class I Editor or Sub-editor
 Class II News Reporter

BUSINESS

Small business on own account—Commodities purchased and sold *e.g.*, Grocer, Stationer, Tailor, etc.

ADVERTISING

- Class I Propaganda Officer
 Class II Advertisement writer

ART

Landscape Artist, Painter, Commercial Artist, Sculptor, Photographer, Actor, Musician, Dancer, Magician, etc.

MANAGEMENT & ORGANISATION

Capacity to start a new business by employing experts and technical assistants

- Class I Manager and Organiser of big concern
 Class II Manager and Organiser of small concern

BROKING

- Class I Stock Exchange Broker, Jute and Share Broker
 Class II Canvasser, Salesman

STENOGRAPHY

- Class I Personal Assistant to Higher Officers, etc.
 Class II Ordinary Steno-typist

HANDICRAFTS

Bookbinder, Goldsmith, Brass worker, Electroplater, Engraver, Tailor, Carpenter, etc.

The distribution of the different vocations recommended so far is shown below on a percentage basis.

1. Service	about 30 %
2. Engineering	„ 29 %
3. Teaching	„ 11 %
4. Business	„ 9 %
5. Medicine	„ 6 %
6. Law	„ 3 %
7. Broking	„ 3 %
8. Handicrafts	„ 3 %
9. Stenography	„ 2 %
10. Actuarial work	
and Accountancy	„ 1 %
11. Journalism	„ 1 %
12. Art	„ 1 %
13. Management and	
Organisation	„ 1 %

It is interesting to note that only about 3% of the candidates examined were found suitable for Class I type of vocations. This includes persons who are likely to be successful in I.C.S., I.M.S., Barristership and like vocations.

B. Intelligence Tests

Both L and M forms of individual intelligence tests as recommended in Terman-Merrill revision of Binet Intelligence Test were administered in order to ascertain the reliability of intelligence testing. Our earlier work showed a certain amount of divergence in the data obtained under these two heads. With some modification of the tests and with increasing experience in the technique of administration the results now show a high degree of correlation. For the purpose of vocational guidance intelligence has been considered under five levels in terms of Intelligence Quotient.

I. Q. Over 140	represents Group	I. obtained by 2.8 % cases
Between 125 and 140	„ „	II. „ „ 20.0 % „
„ 100 „ 125	„ „	III. „ „ 42.1 % „
„ 75 „ 100	„ „	IV. „ „ 30.6 % „
„ 60 „ 75	„ „	V. „ „ 4.5 % „
Below 60	„	VI. „ „ nil „

A classification of this type gives us an indication of the distribution of intelligence among a group of individuals.

Our results compare favourably with those obtained by Winifred Spielman and Cyril Burt in connection with vocational guidance in London (published in the report No. 33 of the Industrial Fatigue Research Board, p. 13) as will be seen from their table :

1.	Over 150	0.2 %
2.	130—150	2.0 %
3.	115—130	10.0 %
4.	100—115	38.0 %
5.	85—100	38.0 %
6.	70—85	10.5 %
7.	50—70	1.5 %
8.	Under 50	0.2 %

Among the cases considered by them the mental ratio varied from 45 to 175 whereas in Bengal it ranged between 60 and 155.

C. Intelligence Tests for lower age groups

The finding of intelligence level of Bengali children of ages below 8 years could not be included in the programme of vocational guidance work. Miss R. Ghosh, Lady Principal of the Gokhale Memorial Institution, who is an ex-student of the department received training in testing from the Section and took up the problem of finding the intelligence level of the Bengali children of 8 years downwards with the help of Terman & Merrill Intelligence Tests L & M forms. She could examine 135 testees so far. No standardization has been attempted as yet owing to the smallness of the data. She is however still continuing her work at Hazaribagh where the institution had to be shifted owing to the present emergent situation in Calcutta.

D. Mechanical Ability Test

According to the scores obtained in this test, mechanical ability was classified under five heads. The distribution of mechanical ability among the candidates is shown below :

Group I. scores 90—76 obtained by 7.4 % cases

„ II. „	70—53	„ „	25.5 % „
„ III. „	52—35	„ „	38.3 % „
„ IV. „	34—17	„ „	23.3 % „
„ V. „	16— 0	„ „	5.5 % „

Contrary to expectations the result shows the presence of a fairly high degree of potential mechanical ability amongst



REACTION TIME TEST

Bengali students. High mechanical ability coupled with high intelligence is found in 1.8 % of cases. These are the persons that are likely to shine in the technical professions.

E. Temperamental Tests

Personality can be boardly classified under two heads, subjective and objective types. The subjective type of personality is more emotional and is more concerned with self. His interest in external objects and situations is less



MECHANICAL ABILITY TEST

marked. He is more a visionary than a practical worker. This type has also been called the introvert type. The objective or extravert type of personality is not so much influenced by moods and self-consideration. He is more matter of fact and

is more actively interested in his environment. The borderline cases are those who cannot be distinguished either as extravert or introvert. The distribution of cases in temperamental tests is as follows, extravert 36·4%, introvert 28·0 %, boderline cases 35·6 %. Here again, contrary to expectations we find that the extravert type is more frequent than the introvert one in the sample taken from among the Bengali youths.

F. Group Intelligence Tests

Group Intelligence Tests was being conducted by the Department for some time past. 3000 students have been examined up to date. The scores obtained by the candidates examined have been classified under five heads and their distribution is as follows :

Scores above	140	Group I.	4·0 %
between 100 and 140		„ II.	18·2 %
„ 60 „ 100		„ III.	41·2 %
„ 20 „ 60		„ IV.	33·2 %
below 20 „		„ V.	3·4 %

Comparison of this table with that of the individual intelligence test on page 17 of this report will show a fair agreement between the two sets of findings.

The scores show a normal distribution with a skew, proving the realiability of the test. One interesting fact has however emerged from this test viz. that a marked diminution of intelligence score is seen at the ages of 16 and 17 ; in other words, it appears from the test that a boy of 17 is less intelligent than a boy of 15 which is obviously an absurdity. The cause for this discrepancy is being investigated at present and it is expected that very interesting psychological factors responsible for bringing about this anomaly will be unearthed.

G. Age Distribution in School Grades

The problem of ascertaining the correct age of students in schools offers innumerable difficulties. It is very difficult to be sure about the information regarding the age given by the student himself or that obtained from his school record. Besides the factor of ignorance, deliberate mis-statements are

often found. The Government imposes an age limit for entry into the different services. Candidates whose ages exceed the limit find great difficulties in obtaining employment. There is thus a tendency on the part of the guardian to record ages lower than the actual for their wards. The students themselves



FORM BOARD TEST

very often repeat what they have been taught to say by their guardians. A good deal of uncertainty thus creeps into the data for age vitiating the findings of intelligence quotient and other co-efficients. Very often the figures for age given

independently by the student, the guardian, the teacher and the school record do not tally. Generally about one year's discrepancy is found among the different figures. Discrepancies amounting to 5 or even 6 years have sometimes been recorded by us. Keeping in mind the difficulties mentioned here, the following tables showing the age discrepancy and the age distribution in different school grades will be found to offer interesting material for study. It will be seen that a difference in age of as much as seven years is generally to be found among students belonging to the same grade. Sometimes the figure is higher than this. For instance, in Grade VII boys of ages ranging from 9 to 18 are to be found. This is a highly undesirable state of affairs. The free mixing of students of pre-and post-puberty ages gives rise to psychological problems. Difficulties are experienced both in administration and in teaching. The mental age may thus vary from 9 to 16 years in the same grade. This means that the same teaching is not likely to be equally efficient with regard to all the students of the class. The problem of age grade distribution has been receiving the attention of the Section.

Age-Grade Distribution Table for boys

Ages	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Total
Grades II	5	20	13	8	0	2									43
III		3	21	13	8	5	2								52
IV		2	16	34	64	25	22	5	6						174
V			1	8	39	39	31	3	9						130
VI				5	45	81	81	33	20	3	1	1			270
VII				1	17	54	155	115	93	15	6	1	3		460
VIII					2	10	78	141	154	119	33	10	3	1	551
IX					1	2	6	34	113	90	42	11	3		302
X							1	5	51	142	110	59	15	1	387
															2869

Age-Grade Distribution Table for girls

[illegible]

Table of Discrepancy in age between the student's version and the school record

Age discrepancy in months	Boys	Girls	Total
1 to 12	227	88	310
12 to 24	71	28	99
24 to 36	28	6	34
36 to 48	6	1	7
48 to 60	4		4
60 to 72	1		1
Total No. of discrepancy-occurrence	337	118	455
No. of cases selected at random for investigation of the question of discrepancy in age	341	447	788
Percentage of discrepancy-occurrence	98.5%	26.4%	57.7%

H. Preference test with regard to different school subjects

Mrs. S. Deb (ne'e. Miss S. Choudhury) has been carrying on investigation on preference test under the guidance of the Head of the Department of Psychology in the Applied Section. She examined about 1000 girls of different schools in East Bengal viz. Dacca, Comilla, Mymensingh, Chittagong, etc. Since July 1940 (i. e., after her joining this department) she has further examined about 1500 school children both boys and girls. She is still carrying on this work. The examinations are conducted very thoroughly and three different tests are given to each child on different days in order to ensure the reliability of the data. From a preliminary survey of the collected material derived from 2500 records it is found that various problems which have important bearings on the educational system of this country are emerging from this work. Two of these which are of the first rate significance are (1) the problem of bilingualism and the other (2) the turning point in the age of a child with regard to his intellectual interests. In connection with the latter it is seen that the interests of the children take a turn at the age of 9/10 years and again at the age of 13/14. It is interesting to note that the children of different age groups are found to be distributed in peculiar and different ways as regards their preference for mother tongue and foreign tongue. Mrs. Deb is at present mainly devoting her attention to the important problem of bilingualism.

A table in percentage showing preference of different school subjects at different ages is given here :

Age :		8	9	10	11	12	13	14	15	16
Subjects :	English	80	27	25	87	80	23	20	13	17
	Bengali	80	19	18	14	25	19	15	26	28
	Arithmetic	12	80	28	22	21	20	12	8	7
	Algebra						15	15	10	12
	Geometry						4	4	5	6
	History		11	11	11	11	11	18	12	8
	Geography		6	6	4	8	5	7	5	5
	Science						9		18	7
	Sanskrit							8		2
Drill or any other similar activity		28	7	12	12	10	8	5		8

I. Clinical Cases

About 250 clinical cases of various types have been examined in the laboratory and suitable recommendations for each case were sent to the parties concerned. This aspect of the work of this Section has become popular and cases are referred to this laboratory by various institutions such as Society of Prevention of Cruelty to Children, the Juvenile Courts, the Police authorities, private practitioners, mental hospitals and clinics, etc., for examination and report.

J. Performance Test on a Criminal Tribe

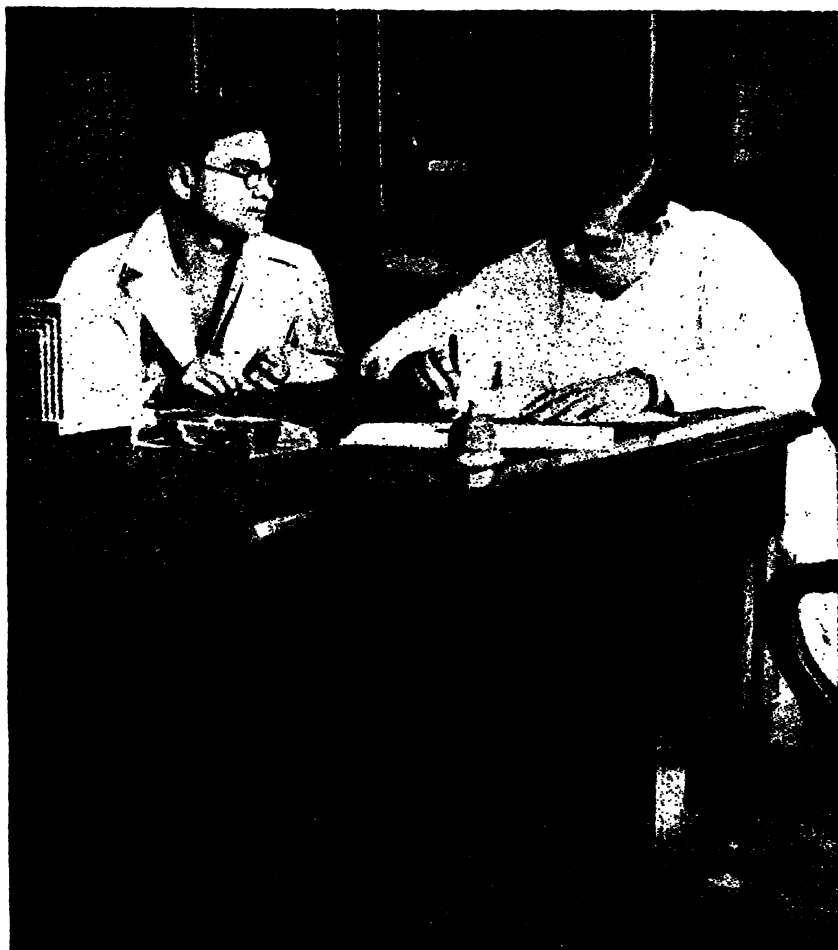
We have been fortunate in securing through the kindness of Dr. B. S. Guha, Superintendent, Zoological Survey of India, about 50 records of Passalong Performance Test administered to Mushahars, a criminal tribe of the Ghazipur district. As there has been some irregularity in the administration of the test and as the cases examined are only 50 in number so no definite conclusion can be arrived at in this case. From the scores obtained by the Mushahars in this test, it seems that the average of concrete intelligence of the group of Mushahars is less than the average score of the adult Bengali students. The average score in the case of Mushahars in the series under review is 14.6 while the average for adult Bengali students is 27.3. Too much importance however should not be attached to this difference as extraneous factors might have contributed in determining the comparatively low record in the case of Mushahars.

Proposals

The details of the work that has so far been done by the Applied Section of the Psychology Department, Calcutta University, have been presented above. Considered from a broad technical point of view as also from the view of the needs of our province the work can only be judged to have been of a preliminary nature. A survey of the whole field of vocational psychology and a careful consideration of the merits and demerits of alternative test programmes were necessary before a final procedure could be chalked out. It is this preliminary task of survey and selection of suitable tests that we have accomplished, and we have just made a start with the actual work of vocational guidance along lines that have been decided upon after due deliberation. What is needed now is to carry on the work extensively as well as intensively. The nature of all mental tests is such that the more numerous the data collected the more refined become the instruments of measurement. A little reflection will make this clear. In order that the test results may be interpreted correctly it is necessary that the test itself be a standardized one. A test does not become standardized all at once. For standardizing a particular test a large number of individuals of different ages have to be tested. At least 500 (1000 would be more desirable) individuals from every age group should be subjected to the test and the results thus obtained should be statistically treated. We have first to begin with a rough test and to modify it on the basis of the data collected. The test so revised may be considered for all practical purposes to be the standard one.

In the Applied Section we have limited our work for the present to seven different age groups. This means that data from at least $500 \times 7 = 3500$ cases of proper ages must be collected before the test may be considered to have been standardized. In three and a half year's time we have been able to examine as stated before only 460 cases. We are as yet far from having standardized tests at our disposal. Our

data need supplementing. But here a difficult question arises. If the testing be confined only to the students of the Calcutta schools and if the task of collecting data, which has now become a routine work, rests solely upon the members of the Applied Section, it will be years before we can complete



TESTEE INTERVIEW

our task. These years will have to be devoted wholly to this routine task alone to the detriment of other equally essential aspects of vocational guidance. 'Job analysis' a necessary counterpart of vocational guidance could not be

tackled so long for the preoccupation of the Section with the aforesaid work. Vocational guidance that is now being given is of a tentative nature because it is based first on test as yet not standardized and secondly on a more or less rough assumption of psychological requirements of jobs. Dependable guidance can only be given when both the 'candidate' and the 'job' for which the candidate is recommended have been fully known. To complete the task of job analysis we shall again have necessarily to pass through different stages of varied work each one of which may consume a considerable amount of time.

It would not be desirable, neither would it be profitable for the University to wait so long for standardized tests and to put off indefinitely other aspects of the guidance work. A revision of the existing plan of work is thus called for. The scheme here set forth is expected primarily to overcome this difficulty of time factor.

As we have pointed out before the first requisite is that a large number of students of varying ages should be tested as quickly as possible. The upper classes of all the schools of Bengal affiliated to the Calcutta University may be at once taken up for examination if the proposed scheme is accepted. The application of the tests is a matter which needs the most careful attention to details, minute observation and recording of the candidates' behaviour and a study of many other psychological characteristics.' It is a highly refined and technical procedure and cannot be entrusted to one unfamiliar with the technique of the tests and of the psychological principles underlying them. The tester has to be very careful how he himself behaves before the candidate, what he says and what he does not say, of the instruction he gives and the way in which he gives it and a number of other details. Thus it is only a trained worker who can undertake the task. Our need then is for a large body of trained workers. It is only this Section of the Psychology Department of the Calcutta University that has concerned itself these years with matters relating to vocational tests. The Section has gathered skill and experience both in the theoretical and in the practical

side of this work and it alone is competent to impart instruction to future workers. It stands to reason then that one of the immediate future task of the Section ought to be the training of persons who would be able under its guidance to carry on the accepted testing programme in all the affiliated schools of Bengal. Incidentally this would also draw the attention of all concerned to the need and importance of studying the problems of students and of their education from



WORD ASSOCIATION TEST

the psychological point of view. Much would be gained if the spirit of psychological study of boys and girls is roused amongst their teachers and guardians in Bengal.

The future worker who comes for training in this Section should have a fair acquaintance with General Psychology, Abnormal Psychology, Child Psychology and Educational Psychology. He should also be familiar with the nature and spirit of psychological experiments. The M. A.'s and M. Sc.'s

in Psychology and the B. T.'s of the different Universities would be the most suitable persons to receive training for our purpose. They will certainly not hesitate to take one year's course of training in the methods of testing if they are assured of some recognition on the completion of their course either in the form of a diploma granted to them by the University



TABULATION OF FINDINGS

or by preference in service over those who have not attended the course. The University can indirectly help in this also by insisting that under certain conditions to be determined by the University certain schools must have career-masters in their staff who would be required to work in collaboration with our Section. Every candidate who attends the course of training would be required to pay his tuition fees and a fee would also be charged for the examination which will be held annually at the completion of the course. A certain percentage of the money thus collected may be credited to the funds of

this Section. This would relieve the University to some extent of its financial responsibility for this Section.

It may be mentioned that a fair demand already exists for such training and the Section received quite a good number of enquiries from different institutions and individuals about the facilities available for receiving training in vocational tests. Candidates from the University of Bombay, the Osmania University, the Calcutta Deaf and Dumb School, the Calcutta Blind School and some teachers approached the Head of the Department with the request for making arrangements to impart specialized training in this line. As no scheme of training by the University was in existence the Head of the Department unfortunately could not render the applicants any help. A further evidence of the existence of the demand for such training is furnished by the fact that there has been a continuous flow of voluntary honorary workers, mostly ex-students of the department, who joined the Section for the purpose of receiving training in testing and other allied work in connection with vocational guidance. The Section has still a fair number of honorary workers on its roll.

If such a scheme be accepted by the University the Section will have to carry on the following duties simultaneously.

1. Teaching work for the diploma course
2. Collection of vocational data
3. Job analysis, devising of vocational selection tests and similar work

The manner in which the Section proposes to fulfil these tasks is indicated below :

Regarding teaching in the diploma course two days in the week will be devoted to the theoretical classes divided into four periods each day. Three days in the week will be fixed for the practical work of holding tests in the different schools of Calcutta under the direct supervision of the staff of the Section. Data for vocational guidance work will thus be collected and they will help the standardization of tests as previously stated. The remaining day of the week

will be taken up in holding seminars where ideas will be exchanged and experiences discussed. The problems of job analysis and other allied research work may be carried out simultaneously by adopting a suitable plan of work so that a few of the members of the staff may remain free to tackle them.

The students who get diplomas after passing the final examination on the completion of their course may find appointment in the schools of Bengal as career-masters. They will then be able to collect within a very short time a huge amount of data regarding the physical and mental equipments of the student population of Bengal and will be in a position to give them valuable advice as to their appropriate future career.

We therefore strongly plead for the creation of a diploma course in vocational guidance. The benefits that would accrue from the creation of the course are :

1. It would speed up the work of standardization of the tests.

2. If the University advises the school authorities to give preference to the diploma holders in Applied Psychology in the matter of appointment of teachers it would stimulate the study and research of the various psychological problems in connection with education.

3. It would relieve the present workers of the Section of much of their routine work and would enable them to take up other important matters, e.g., job analysis, which have already been held up too long for want of adequate staff.

APPENDIX A

The original scheme submitted to Mr. (now Hon'ble Dr.) Syamaprasad Mookerjee the then Vice-Chancellor was as follows :

The usefulness of applying psychological tests and methods in the different avocations of life is being increasingly felt all over the world in devising courses of training, for developing latent capacities, in suggesting suitable careers and vocations by analysing and measuring mental ability, in choosing proper persons for proper posts, in preventing waste of human material in industries and factories, in curing certain types of mentally afflicted persons, in dealing with defective, deficient and problem children and in various other ways. Psychology in other countries has demonstrated its ability to render valuable help and to act as a dependable guide. The University already possesses a well equipped Laboratory of Psychology and with a little effort it is quite possible to start work along lines indicated above.

The Department of Psychology has been engaged for some time past in devising and standardizing mental tests in the Bengali language suitable for local conditions and a research scholar has been specially appointed for the purpose. At the present state it will not be possible perhaps to take up all the different branches that come under the category of Applied Psychology but special efforts can easily be made to develop the technique of vocational guidance and vocational selection and to apply the same to practical ends. The system of giving advice to parents and guardians regarding their backward children already being followed by the Department can be put on a wider basis. Courses of training can be devised to develop desirable traits in boys and girls to enable them to adapt themselves to the social environment much more efficiently

than they could do without such help. Investigations may be carried on for determining the careers available to students. The necessary qualifications that go to ensure success in each vocation or calling may be ascertained and suitable measures for their appraisal and development may be devised. All these would go to help in the solution of the problem of unemployment to some extent. It is up to the University to take a lead in this direction. The Information and Appointment Board of the University that is already in existence may work in collaboration with the Department of Psychology in giving effect to these proposals.

To enable the Department of Psychology to take up the work proposed below, certain additions and alterations in the present working arrangement of the Department will have to be made. It is to be noted in this connection that according to the revised syllabus of the Post Graduate Course, Industrial Psychology has been adopted as a special subject. The new proposal, therefore, should take into consideration the extension of work necessitated by this revision. For the present provision should be made to carry on the work of Applied Psychology for at least five years. It is hoped that by the end of this time standardization of tests will be completed and some definite results will be obtained. The work contemplated to be carried on under this section may be summarized thus :

1. Devising tests for vocational guidance suitable to Indian conditions and standardization of the same.

2. Devising tests for vocational selection and standardization of the same.

3. Collection of vocational data, e.g. available posts for each vocation, expected income, etc.

(To be carried on in co-operation with the Information and Appointment Board of the University).

4. Industrial Guidance, e.g., methods of increased output, matters of strike, discontent of workers, etc.

5. Investigation in Criminology.

6. Guidance in the matter of defective children, problem children.

7. Application of Educational Tests.

It is proposed at present to concentrate more on items 1, 2, 3, 6 & 7.

Provision has been made for theoretical instruction in these subjects in the new M.A. and M.Sc. syllabus but for actual work on these lines an efficient staff of workers is needed. Such work involves a good deal of propaganda, contact with the public, with the authorities of schools and with the parents and guardians of students as also much travelling here and there. It is proposed therefore that two whole time men, one lecturer and one assistant lecturer should be entrusted with the duties of this Section, and at least five students who have already passed the M.A. or M.Sc. examination in Experimental Psychology be appointed by the University as research scholars to work as directed by the Department. A research fellow having special training in the line may also be appointed. These workers should attend the theoretical classes in Industrial Psychology and carry on the actual testing in schools and other places. The assistant lecturer will supervise their work and make all preliminary arrangements with schools, factories, etc., and visit the parents and guardians of the students. The lecturer in charge of this Section will be responsible to the Head of the Department of Psychology for the work in his Section and it is needless to mention that the Head of the Department will be responsible to the University.

In the first year the Department, for the sake of collection of materials and standardization and modification of existing tests, should test at least five hundred senior students of different schools. Later on when the tests have been standardized, any one desiring to have his ward tested should pay a fee which would be credited to the funds of the Section. Proprietors of factories and other industrial concerns would be also required to pay a fee to be determined by the University in consultation with the Department for having psychological tests carried on in their respective concerns.

For this Section the services of a typist clerk and of a bearer would be necessary.

On the basis of the above proposal the following budget estimate for the Applied Section is drawn up :

One Lecturer	(200-20-500)	Rs. 500/-	Rs. 6000/-	yearly
One Asst. Lecturer	(150-15-300)	Rs. 150/-	Rs. 1800/-	„
One Typist Clerk	(40-5.120)	Rs. 40/-	Rs. 480/-	„
One Bearer	(15- $\frac{1}{3}$ -20)	Rs. 15/-	Rs. 180/-	„
One Research Fellow	(125)	Rs. 125/-	Rs. 1500/-	„
Five „ Scholars (each 75/-)		Rs. 375/-	Rs. 4500/-	„
Conveyance, printing, etc.		Rs. 200/-	Rs. 2400/-	„
Non-recurring grant for this year			Rs. 2500/-	„
			<hr/>	
			Rs. 19360/-	„
			<hr/>	

APPENDIX B

Scheme as sanctioned by the Senate

On the 18th June 1938 the Senate sanctioned the establishment of an Applied Section for three academic years from 1938-39 to 1940-41. For running the Applied Section the following items of expenditure were also sanctioned in that meeting of the Senate.

One part-time lecturer in lieu of the part time services of a lecturer lent to the Applied Section		
	@ 50/- p.m.	600/- yearly
One Research Fellow	@ 12 1/2/- "	1500/- "
Five Research Scholars	@ 7 1/2/- "	4500/- "
One Typist Clerk	@ 4 1/2/- "	540/- "
One Bearer	@ 16/- "	192/- "
Conveyance, Printing, etc.		2500/- "
Non-recurring grant for equipment		2500/- "
		<hr/>
		Rs. 12332/- "
		<hr/>

The lease of life of the Applied Section was extended for a further period of one academic year 1941-42 by the Executive Committee in its meeting on June 1941. The items of expenditure as stated above were also sanctioned with the exception of the last one.

The Section began to function from about the 1st week of September 1938 with four research scholars, one typist and a bearer and Mr. M. N. Banerji, senior lecturer was placed in charge of the Section. The remaining one of the five research scholars sanctioned by the authorities was appointed on 1.4.39. The post of the research fellow was in abeyance up to 30.7.40., when it was filled up.

APPENDIX C

DESCRIPTION OF TESTS

For reference see pages 8 and 9

1. Intelligence :

Workers in the field of psychology believe that the intelligence of a person reveals itself first in his capacity of grasping relations, of forming associations, of retaining learnt materials etc., and secondly in his ability to face actual problems of life, to adapt his behaviour to the demands of different situations, etc. The aspect of intelligence as expressed by the first group of behaviour is technically known as Abstract Intelligence and that by the second group Concrete Intelligence. Intelligence tests are designed to find out the extent of these capacities present in a person.

- (i) **Abstract Intelligence :** The latest revision of Binet Simon test by Terman and Merrill (L and M forms) is one of such standard tests that have been adopted by this Section for measuring the abstract intelligence of the testees. It consists mainly in putting questions involving 'Problems of facts', 'Reconciliations of opposites', 'Verbal absurdities', etc. The level of intelligence is determined on the basis of answers returned by the candidates. The test is a verbal one.
- (ii) **Concrete Intelligence :** Hundreds of tests have been designed to measure concrete intelligence of individuals. The Passalong Test by Alexander, the Form-board Test by Dearborn, the Block Design Test by Kohs and the Cube Construction Test have been

adopted by the Section. In these tests the testee is required to arrange a number of wooden blocks of different shapes, sizes and shades of colour in such a way as to solve the concrete problem set before him. The level of concrete intelligence is determined on the basis of the time taken and the number of movements made by the candidate as also by the degree of completeness of the solution.

2. Special Abilities :

Proficiency in any vocation presupposes besides intelligence the existence of some sort of special ability in the candidate. It may be presumed that a successful mechanical engineer possesses in addition to his other qualifications, a special ability in dealing with tools and implements ; this may be described as mechanical ability. By analysing different vocations psychologists have been able to isolate many ability factors, and they have also devised appropriate tests for the detection and measurement of these abilities in any person. The list of abilities measured by the Section and the corresponding tests are given below.

- (i) **Mechanical ability :** In this test the person concerned is required to build up a complete tool by assembling its dismembered parts placed before him within a given time. The degree of completeness of the task is a measure of his mechanical ability.
- (ii) **Manual ability :** The candidate has to arrange within a time limit a number of wooden blocks as also bolts and nuts according to a set plan. The number of the different pieces so arranged gives the measure of his manual ability.
- (iii) **Manual dexterity :** The speed with which one can perform tasks like threading a definite number of eye holes, etc., a given number of times, measures his manual dexterity.

- (iv) **Constructional ability :** In this test the testee is supplied with wooden pieces of various shapes and sizes and is asked to build up, the best possible model such as a house, a cart, etc., according to his own ideas. The richness of conception as displayed in the choice of the model and the skill with which the chosen model is executed determine the constructional ability of the candidate.

3. Temperament :

As men differ amongst themselves in intellect so there are differences also in their emotional constitution. Two men do not react emotionally in a similar way to the same situation. This inherent emotional constitution is described by the term temperament. Tests have been designed to determine the nature of an individual's temperament. Those adopted by the Section are given below :

- (i) **Subjective paired questions :** The object of this test is to find out the subject's estimate about himself. The test consists of 30 paired questions. The first portion is the opposite of the second part, e.g., Are you courageous or timid? In this test a candidate is advised to answer according to his own impressions without depending on others' notion. The subjective estimate of the candidate is found out after scanning the answers given by him.
- (ii) **Extravert-Introvert Test :** The introvert type of personality is more emotional and is more concerned with self. The interest of a person of this type in external objects and situations is less marked. An introvert person is generally shy and cannot mix freely in society. The extravert type is just the opposite of the introvert type. An extravert person can easily mix with others and can without any difficulty establish friendship. This test consists of fifty ideas, and whether a candidate is an extravert or an introvert is determined by the

nature of the answers given by the candidate. He is advised to give his answers according as the ideas expressed by the questions appear pleasant or unpleasant to him.

- (iii) **Word Association :** One hundred words, e. g., horse, house, knife, blood, etc., are read out successively to a candidate. He is asked to say the first reaction word that crosses his mind after hearing each stimulus word. The reaction words, the time taken in producing them, etc., are noted. The unconscious of the testee is revealed from the data thus obtained. Unconscious motives often influence our choice for a particular vocation.
- (iv) **Neurotic questionnaire :** The mental peculiarity of the testee and his proneness to mental disease reveal themselves in this test. The candidate is asked a variety of questions such as (1) Do you ever walk about in your sleep ?, (2) Have you ever felt a strong desire to go and set fire to something ?, (3) Have you ever had a strong wish to commit suicide ?, etc. By scrutinizing the answers of the candidate we are in a position to know his mental constitution.

4. Scholastic Ability :

A reference to the school records of a candidate of his different examinations gives us an idea of his proficiency in different school subjects.

Reading : The candidate is asked to read a passage for five minutes. The number of words that he can read within the time limit without making any error in punctuation, prononnciation, and pattern of the words gives his score for reading.

5. Psychological Trait :

Reaction time : The reaction time of a candidate is measured with the help of a chronoscope. It is seen how quickly he can react on receiving a signal.

6. Physical Traits :

By physical examination the health, the eye sight, the acuity of hearing, the capacity for work, etc., of the candidate are ascertained.

7. Interview :

The examiner enters into conversation with the testee in order to get at the following information : ambition, vocational opportunity, vocational plan if any, and the like. The examiner bases his opinion of the candidate on the manner in which he speaks, behaves, attacks problems in the course of the interview and responds to the tests.

APPENDIX D

Plan of administration of tests in successive series

For reference see page 9

The tests have been divided in two groups (1) Compulsory, to be administered to all students and (2) serial, i.e., successive series as chalked out in the following plan to be administered in successive schools.

Compulsory Tests		Time required for administration	
A	Terman L (without the vocabulary portion ; Bengali Vocabulary Test is administered along with our own English Vocabulary Test for standardization. English and Bengali vocabulary tests are shown separately in G. & II.)	....	60 minutes
B	Passalong	....	45 "
C	Word Association	....	45 "
D	Medical	....	20 "
G	Bengali Vocabulary	....	20 "
H	English Vocabulary	...	20 "
Serial Tests			
I	Form Board	...	30 "
II	Extravert-Introvert	....	15 "
III	Reaction Time	...	10 "
IV	Terman M	...	70 "
V	Mechanical	...	45 "
VI	Constructional	...	45 "
VII	Subjective Paired Questions	....	30 "
VIII	Cube Construction	....	25 "
IX	Reading	...	10 "
X	Mental Constitution	...	45 "
XI	Manual Dexterity	....	30 "

Plan of administration of eleven series of five tests each out of the total of eleven tests. Two tests are common to any two series.

Series	1	Tests	I	III	IV	V	IX
"	2	"	II	IV	V	VI	X
"	3	"	III	V	VI	VII	XI
"	4	"	IV	VI	VII	VIII	I
"	5	"	V	VII	VIII	IX	II
"	6	"	VI	VIII	IX	X	III
"	7	"	VII	IX	X	XI	IV
"	8	"	VIII	X	XI	I	V
"	9	"	IX	XI	I	II	VI
"	10	"	X	I	II	III	VII
"	11	"	XI	II	III	IV	VIII

Plan of Distribution of Tests

Series	TESTS APPLIED		Examiner 1	Approximate Time in minutes.	Examiner 2	Approximate Time in minutes	Examiner 3	Approximate Time in minutes	Examiner 4	Approximate Time in minutes
	Compulsory Tests	Serial Tests according to plan								
1	A B C D G H	I. III. IV. V. IX.	60 20 10 A. H. III.	90	45 45 B. C.	90	20 30 45 G. I. V.	95	20 70 10 D. IV. IX.	100
2	-do-	II. IV. V. VI. X.	60 45 A. X.	105	20 15 70 G. II. IV.	105	45 20 45 C. H. V.	110	45 20 45 B. D. VI.	110
3	-do-	III. V. VI. VII. XI.	60 20 10 A. H. III.	90	45 45 B. C.	90	20 45 80 G. V. XI.	95	20 45 80 D. VI. VII.	95
4	-do-	IV. VI. VII. VIII. I.	60 20 20 A. G. H.	100	45 20 45 B. D. VI.	110	45 80 25 C. I. VIII.	100	70 80 IV. VII.	100
5	-do-	V. VII. VIII. IX. II.	60 20 A. H.	80	45 20 20 B. D. G.	85	45 80 10 C. VII. IX.	85	15 45 25 II. V. VIII.	85
6	-do-	VI. VIII. IX. X. III.	60 20 A. H.	80	45 20 10 10 B. G. III. IX.	85	45 45 C. X.	90	20 45 25 D. VI. VIII.	90
7	-do-	VII. IX. X. XI. IV.	60 20 20 A. G. H.	100	45 45 10 B. C. IX.	100	20 80 45 D. VII. X.	95	70 80 IV. XI.	100
8	-do-	VIII. X. XI. I. V.	60 20 20 A. G. H.	100	45 20 80 B. D. I.	95	45 80 25 C. VIII. XI.	100	45 45 V. X.	90
9	-do-	IX. XI. I. II. VI.	60 20 A. H.	80	45 45 B. C.	90	20 20 45 D. H. VI.	85	30 15 10 80 I. II. IX. XI.	85
10	-do-	X. I. II. III. VII.	60 20 A. H.	80	45 45 B. C.	90	20 20 80 15 D. H. I. II.	85	10 80 45 III. VII. X.	85
11	-do-	XI. II. III. IV. VIII.	60 20 10 A. H. III.	90	45 20 25 B. G. VIII.	90	45 15 80 C. II. XI.	90	20 70 D. IV.	90

Figure over each letter and Roman numeral indicates approximate time required for administration of the test

THE CONCEPT OF INSTINCT IN ITS NEW SETTING

N. N. SENGUPTA

I

Modern Psychology and Social Sciences use the conception of instinct as the principle of explanation in many spheres of facts. Its analysis, therefore, should be of some value in both of these fields of study. A wide difference in the use of the term gives rise to a certain vagueness in regard to its connotation. It becomes a notion of doubtful value for scientific purposes.

Again, many of these theories serve as the starting-points in the process of formation of social attitudes. The idea, for instance, that instinct is an inevitable urge, an expression of the "life-force" as a literary romanticist describes it, certainly carries with it the implication that the attempt at social and moral discipline of instinct is a futile undertaking. A view is gaining ground, on the basis of a misunderstanding of the theories of the Abnormal Psychology, that on the whole inhibition of impulses is injurious to body and mind. These attitudes which determine our decisions and conduct should be re-oriented on a more precise definition and understanding of the instinctive life.

II

The concept of instinct has been a topic of great interest to psychologists during the last few years. (i) On one side it has been viewed as a psycho-physical function of an exceedingly complex character. It has been invested with a varied array of psychic correlates such as perceptions, emotions, meanings, intelligence and impulses—to say nothing of certain other accompaniments of uncertain filiation such as 'urges' and 'drives.' It has been assumed to transform itself from an overt physical act into a sublimated sentiment or idea; it has been supposed to play its part in the nether region of the unconscious as well as in the field of consciousness. Instinct, in short, has appeared as an agency of indefinite potentiality and as a concept of uncertain connotation in the recent view of mental life. (ii) On the other side, many have asked whether it is necessary to retain the notion of instinct as a distinctive psycho-physical function or as a significant concept. The analysis and discussions have not yet reached

a stage when any agreement or conciliation of the discordant ideas seems possible.

The need of a more precise determination of the significance of the term, however, is felt by all students of psychology. The lines of enquiry pursued at the present time fall into six different groups:

(i) In the first place, there is an attempt to describe what may be called the phenomenology of instinct. We have the description of instincts as activities common to all members of the species, as unlearned and relatively invariable modes of re-actions, as 'all or none' responses, as distinguishable into 'preparatory' and 'consummatory,' 'overt' and 'incipient' phases. The traditional description of naturalists, some of the behaviourist analysis and the studies of Rivers may be subsumed under this class.

(ii) Secondly, there is an effort to classify instincts either on the basis of the consummation reached by each mode of activity or in terms of phenomenal characteristics. The contributions of MacDougall and Marshall as also some of the studies of mental pathologists may be included in this category.

(iii) The third type of research is directed towards defining the relation of instincts to mental life in general. Such views as those of Psycho-analysis or of those who maintain a more general form of the Hermetic theory of mental phenomena belong to this class.

(iv) The fourth line of enquiry is concerned with the definition of the character of stimulation in the case of instinctive activity. The behaviourists' attempt to encompass all psycho-physical functions under the stimulus-response pattern, the Gestalt analysis of stimuli as patterns as also the views of those who claim a psychic or central antecedent of some sort, like perception, all illustrate this standpoint.

(v) The fifth class of studies, of which there are unfortunately very few, are concerned with the determination of the neural correlates of instinctive acts. Many of the older studies of decerebrated animals like those of Goltz and Foster as also some of Sherrington's studies, the analysis of responses of decerebrated frogs are directed to this end. The theory of Rivers about the thalamic centre, on the basis of which he proposes to call instincts "protopathic responses," is also an instance in point.

(vi) The sixth question which psychologists have been trying to solve is that of the factor which integrates the complex movements and intra-organic adjustments into a unitary whole to which the name 'instinct' is usually given. Stout's conception of meaning as an antecedent to instinct, the Gestalt view of impulse and Bergson's *élan vital* as also the entelechy of New-vitalism supply the psychic principle of integration. Heredity and

'facilitation' of neural paths through practice are some of the ways of physical explanation of integration. A conception of instinct in order that it may prove fruitful in psychology must base itself upon the various channels of investigation.

III

The idea of instinct which I wish to suggest in this paper is that *instinct is a series of responses, synchronous and successive, invariably conditioned by a hypertrophic condition of the internal organs of visceral, digestive, reproductive, etc., systems.*

I begin with MacDougall's view of instinct. He maintains that emotion is the only component of instinct which does not change; both perception with which instinctive actions begin and movements vary according to circumstances. Emotions, however, we may concede whether we accept the James-Lange theory or not, are accompanied by an over-functioning of the internal organs. Whether the complex psychic phenomena which MacDougall attributes to instincts, may exist in all cases of instinctive activity is a matter of considerable doubt if we consider the sub-human scales of life. It may not, however, be difficult to believe that there is a relatively intensive activity of the internal organs as correlates of instinctive movements.

The cases of anxiety, neurosis, are marked by intensive organic sensations and, therefore, by a hypertrophic conditions of the internal organs. Since these pathologic conditions are said to be induced by certain persistent instinctive tendencies, the organic condition may be regarded as the accompaniment of the instinct. In other types of mental disorders, too, in which the causative factor is said to be a persistent instinctive urge, there is a marked persistence of organic hypertrophy.

Again, certain instinctive responses are easily aroused when some of the internal organs are in a state of hypertrophy due to disease. Aggressive behaviour, for instance, the tendency to hit others among children, is said to be more frequent when they suffer from digestive troubles. Some kinds of digestive trouble in adults is said to induce a frequent sexual propensity.

Fourthly, instincts and emotions have been regarded as being in some way equivalent. James regarded the two as phases of the same complex process. Instinct, he said, is a way of acting on a situation as emotion is a way of feeling it. It is a matter of common observation that no hard and fast line of demarcation can be drawn between, say, fear and flight or between "tender emotions" (in MacDougall's sense) and the act of 'coddling.' Applying the principle of our first argument we may say that

organic sensations being correlates of emotions must be conceived as bearing a definite relation to instincts. This hypothesis is further borne out by certain cases of mental disorders in which an instinctive tendency may manifest itself as an overt action, as an emotional experience or as a disturbed function of some of the internal organs. Lastly, in normal cases, the activities which are agreed by all to be instinctive such as aggression, sex-proclivities and flight are accompanied by increased functioning of a number of internal organs.

It is reasonable then to conclude that hypertrophic state of the internal organs of the digestive, reproductive, respiratory and other systems, is an accompaniment of the motor-processes known as instinctive. We shall next pass on to consider how this hypertrophic function can be said to be a condition of the motor processes called instinctive activities. I suggest that the afferent impulses set up by the stimulation of these organs distribute themselves along the appropriate spinal centres; by irradiation, by following a common path and by the inhibition phenomena exhibited in the case of reflexes, a series of motor processes is maintained as long as the hypertrophic condition persists. If the normal motor outlet is inhibited, the impulses follow a more circuitous route through the higher centres and consciousness appears. This is what, I suggest, happens in the case of the phenomena related to the inhibition of instinctive activities. Emotion and experiences, then, would appear when a new motor-channel has to be opened up or the old ones blocked. Gradually, the conscious states would disappear, as paths are established or restored leaving the internal organs to supply the afferent impulses. Again, Parsons suggests that when a large number of impulses afferent and efferent have to be co-ordinated, consciousness of various orders of complexity appears as the synthesising factor. We may at least admit that consciousness appears in such cases whether we accept its synthetic function or not. This would account for the fact the conflict of instinctive acts is attended with emotional experiences and ideational processes of considerable complexity. Their function seems to be to initiate a large variety of incipient motor states so that a number of channels might be found for the final outlet of impulses.

We may, then, say that when the internal organs function together and in excess of their normal tenor of activity, they serve to open up a series of motor channels. The activities that ensue results from the synchronous, alternating or successive working of these channels as long as the afferent conditions persist. The internal organs keep one another in a stimulated condition. Hence the motor process runs a definite temporal course. When the afferent impulses take the longer route through the higher centres, the same situation prevails.

IV

This conception of instinctive activity is not new. It has been maintained in more or less elaborate form by many. There are certain special advantages of the hypothesis. (i) In the first place, it enables us to explain the instinctive acts of subhuman organisms without attributing emotions or perceptions. The working of the organs determines the movements. So long as the internal organs and muscular system are similar, the reactions would be similar. (ii) Secondly, it enables us to account for the response of decerebrated organisms. Even spinal frogs exhibit the phenomenon of sexual clasp. This can happen because the internal organs are left to work. (iii) Thirdly, it enables us to explain some of the symptoms in anxiety neurosis and hysteria. These organic functions may appear purely as physical symptoms such as digestive troubles, arrhythmia of the heart, etc. This would be so, if we were to conceive a direct relation between the motor process and organic functions without the mediation of consciousness. (iv) Finally, the question of integration of the movements may not appear so difficult. For we know that a number of internal organs function together especially when they are stimulated to a high degree of intensity. They also persist in a stimulated condition. Hence, a durable flow of afferent impulses is ensured which in turn sustain the motor states.

The conditions for the stimulation of the internal organs may be varied in character. They may originate from psychic sources, they may arise from the chemical changes or they may arise from previous excitation. They may also be due to the character of the make-up of the body. There is no need for assuming a particular source of stimulation. This view would be in keeping with the fact that some instinctive activities are present in delusional states when no external stimulus can be discovered. Heredity, training, disease, as well as external stimuli may all be ranged as conditions of organic functions.

V

A physiological conception of instinct may fruitfully be formulated on the basis of the phenomena we have surveyed. (i) Instincts represent the integration of three factors: (a) motor responses, (b) visceral changes, (c) emotions and other orders of experience. Where can such union take place? (ii) Again, instinctive behaviour takes place on a pattern which seems to be pre-determined for the individual. It appears to be stereotyped; discriminative judgment plays in it a small part. (iii) Instinctive behaviour exhibits the greatest degree of resemblance between man and lower animals. It must be controlled then by a mechanism which is equally effective in the animal and the sub-human orders of life. (iv)

Decerebrated organisms have been found to be capable of several orders of instinctive behaviour. Frogs are capable of sexual clasp. Dogs in Sherrington's laboratory barked at strangers in their habitual way. The mechanism that controls instinctive behaviour, then, must be sub cortical.

The sub-cortical organ that can fulfil all these requirements is optic thalamus. It has in it the representation of sensory and motor centres. It is both afferent and efferent in its function. It is also in close communication with the cortex. It has served at a certain stage of evolution as the principal organ of behaviour adjustment and conscious experience which might have been of a rudimentary order. It is found, again, that the instinct reactions assume the character of "All or none" responses. They also manifest a want of differentiation in the space discrimination. These features impart to behaviour the stamp of a certain order of life. Head and Rivers describe instructive behaviour as "protopathic response" which would lead us to the plane of life in which the optic thalamus is the central executive of the body. It is for this reason that instincts show such resemblances to the behaviour of sub-human life. For, the thalamus a large part to play in the adjustment of life of the vertebrates. Hence, the analysis of Head and Rivers which ascribes instinct to the thalamus has a significant body of facts to support it.

VI

Cannon has been trying to demonstrate that there exists in the human body an alternative arrangement for the carrying on of the bodily functions. It is possible, he says, that the nervous impulses should be very largely mediated by chemical processes rather than by the operation of external stimuli of various orders. Pituitrin, adrenalin, sympathine and acetylcholine are some of the chemicals that are secreted by glands and certain muscles. It is thus possible for the organism to carry on its bodily functions without any stimulation from the external world. We may well conceive it as a stage of life 'introvert' in the neurological sense.

These secretions of chemicals take place under the stress of emotions. Hence we may say that "neural introversion" is a feature of the thalamic plane of life. For, emotions are functions of the thalamus so far as we know today. And emotions are correlated with instincts. We can thus say that instinctive behaviour is a mode of adjustment to the environment when the organism is "neurally introverted" and functions autogenically.

Such adjustment has two characteristics: (i) It marshalls the energies of the organism. The autogenic stimulation recovers all that can be recovered from the store of energy that has been laid by in the course of evolution.

(ii) But at the same time it cannot properly take account of the environment, the stimulations from which are not important for its operations. Hence instinctive behaviour is 'blind.'

VII

This leads us to certain other considerations: (i) Instinctive responses are replaced in human beings by a more structured scheme of behaviour. As a matter of fact the whole instinctive pattern of life seems to subsist as an independent schema in man's life and experience. Roughly speaking, we can say that the distinction between the "public" and the "private" life of cultural societies corresponds to the cortically controlled and the thalamically controlled behaviour. The whole range of instinctive-emotive response is relegated to private life while discriminative responses are relegated to public life.

Social festivals and ceremonies are attempts at making 'public' what the course of evolution has relegated to 'privacy.' This conception seems to be supported by the fact that the orgies of primitive life are but social transformations of instinctive acts. The ceremonies and festivals of the civilised man are likewise attempts at giving a public expression to instinctive and emotive types of conduct.

(ii) The contrast between the instinctive and the emotive types of behaviour and discriminative behaviour finally results in a further process of supersession. The order of discriminative response renders the more primitive behaviour to unconscious. Henceforth, it can appear in consciousness only when it can achieve a compromise with discriminative and cortical behaviour pattern.

The primitive life, thus, appears in the operations of unconscious tendencies and the social orgies. It is also a phase which man can entertain in his private life. We can, then, say that the social culture system and human intellect represent the achievement of the race in the course of evolution. It maintains a contact with the total range of ordered behaviour that a race has accumulated and in which each individual is called upon to participate. To go back on it is to dissociate oneself from the points of vantage that the society has won in the course of evolution.

The instinctive-emotive behaviour, on the other hand, keeps touch with what is primitive in life. It places man in contact with the trends that he inherits from his ancestors. It also establishes his contact with the vaster scheme of behaviour found in the animal kingdom. It keeps the door open for man to utilise for his purposes the adjustments that nature has secured in the long course of evolution.

VIII

Instinct, then, is a process that begins with intensive changes in the internal organs and ends in motor responses of various types. Psychic processes of various orders of complexity may supervene upon this basic structure. Their presence, however, is not indispensable.

Instinctive behaviour, thus, arises through the operation of the factors that alter the function of the various internal organs, of digestion, circulation, respiration and reproduction, by raising them to a high pitch of intensity and blending them. These, however, are interlaced in many ways with the whole of the physical and social *milieu* of an organism. Hence, we may say that instinctive behaviour develops when there is a disturbance in the nice balance subsisting between the bodily processes and the environment. We may think of this condition in two ways: (i) The state of unbalance may arise through the vicissitudes of the body. For instance, the awakening of the sex-impulses in puberty, or their quiescence in senescence, represents a change in the working of the organs of the body. Disease and starvation may bring into play the various patterns of instinct that are not otherwise manifest. (ii) It may also arise from sudden and marked alteration in the configuration of the objects of the environment. This is instanced by cataclysmic changes in nature, appearance of sudden danger or novelty of social situation.

It is obvious, then, that it is possible to stabilise the instinctive life and to direct it into regulated channels of activity through a process of conditioning of the social and physical factors in the environment. This fact has been patent throughout the history of group-life. It needs emphasis today inasmuch as there is an utter uncertainty in regard to the character of instincts. On the one hand it is maintained that instincts can be altered as we please. Therefore, any social programme that may involve a radical change in man's normal ways of life in the history of a race, is often proposed. On the other hand, it is maintained that the instinct must run a predestined course in the life of the individual.

The analysis presented above does not support either of the alternatives. The organs of the body, the circulation, the glandular and the other systems noted above may be altered; but they have a rhythm and a law of activity of their own. These have been determined by a long course of evolution and thus represent the factor of heredity. On the other hand, it is manifest that changes in the environment can certainly alter within limits the functions of these factors. It is possible to intensify and synchronise their activities. To that extent it is possible to discipline the life of instinct, to alter its rhythm and to compel it to express itself in different patterns of combination.

Psychology of instinct, then, supports neither psychological fatalism nor fills social experimentalism. It stresses the fact that life thrives on maintaining a balance between all the factors of the body and the diverse objects of the environment in which the organism is placed. Life of instinct achieves fulfilment and maturity in the process which keeps up such interlacing and balance.

IX

The anomalies of crowd-behaviour are well-known to students of social psychology. The unison of crowd life is one of the phases and can be explained as a phenomenon of reversion of all the individuals to the thalamic plane and to the stage of "neural introversion" as defined above.

The setting of a revival meeting in which a variety of emotive scenes are enacted, the crowd behaviour in catastrophe which shows a considerable discordance of response as between individuals, needs some other explanation. The manifest of exuberance of emotion which is so obvious in the setting of the crowd may be viewed as a conflict-phenomenon. Hysterical laughter and weeping, maniac energy or crushing depression that seize upon the mind, represent attempts at the adjustment of the "neurally introverted" organism to adjust itself to an external situation which it but imperfectly discriminates. Yet, a discriminative mode of response is demanded in the situation. The simultaneous emergence of the two patterns of behaviour precipitates a conflict which brings about the condition of emotional tension.

Again, the "naturally introverted organism" has, for the time being, become 'undiscriminating' in its behaviour attitude. It is not in a position to pick and choose between the various plans of action. It follows, then, that any plan clearly enunciated and stated with sufficient emphasis to break through the barrier of introversion would release the associative and the motor processes. This is what is known as the increase in the suggestibility of the crowd.

The crowd situation is an attempt to harness what has been described above as biologically "private" to the individual for the purposes which are 'structured' by social culture. Reason and emotion oscillate in the arena of mind leading to a chaos of both. Yet, man oscillates perpetually between these two planes, private and public. The rival political and social schemes carry their appeal to one or to the other pattern of behaviour and motives. And all compromises make for a hopeless confusion of two incompatible schemes. They can be welded together only in orgies. It is for this reason that new programmes and party-plans are associated with all the symbols and rituals of primitive orgies.

Several other facts may probably be explained on the same basis. The rage of "society" in large cities when the private life of people is relegated to the background, is an attempt to effect a compromise between 'private' life that carries itself on in the setting of instincts and emotions and the 'public' life of stereotyped behaviour. The clubs and coteries are in a similar manner attempts at a synthesis of the more structured behaviour with the emotive-instinctive patterns. But the process of standardisation of behaviour proceeds at a rapid pace in the large cities of huge human conglomerations, as a measure of defence against social chaos. Hence the desired compromise falls short of the need.

It is possible that the new romanticism that extols what is called Bohemianism—it is doubtful if the people of Bohemia would regard it as a compliment—is a call for reversion to the plane of what we have called 'private' life. The same thing can be said about the fervid interest of romantic minds in the primitive people, in labourers, in the social workers who work in the slums and about others who attempt to put themselves in touch with the intimate life of people with other *mores* and customs. In all these, the hidden psychological motive is to find a synthesis, by projection and, therefore, by vicarious fulfilment, of one's own 'private' life with the public standard of behaviour.

The present culture-complex in the well-organised societies is entirely oriented to economic standards, stresses and structures. It attempts to deny differentiation and cultivation of almost everything devoid of economic significance. The private life of man—the life of instincts, emotions and their expression—weaves its strands into new textures on something other than the economic loom. More and more of human interests cease in this way to be "structured" by social contacts. A chaos of life begins to set in behind the scenes of social laws, behind even the scenes of principles that man must accept for his essential adjustment. Parallel to economic differentiation there grows up in this way a plane of "*protopathic*" urges, social and personal. These represent the residue that economic adjustment leaves out.

The problem of social re-orientation, then, is not merely economic or social or legal. Its basis lies in man's psychological nature. Social diagnosis and the remedies for social evils must fully explore the psychological structure of the personality processes.

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THE PSYCHOLOGY OF CLOTHES

OWEN BERKELEY-HILL

Introduction: Many years ago Herbert Spencer observed that the consciousness of being perfectly well dressed could bestow a 'peace such as religion cannot give.' Most people who are in a position to afford exquisite clothes and are willing to obtain and wear them, will probably subscribe to this statement. It is therefore remarkable that there are so few books on the psychology of clothes while there are so many on the psychology of religion. In his admirable work on the psychology of clothes, Dr. J. C. Flugel reviews the topic from three main standpoints—decoration, modesty and protection. As some such approach is very essential to the treatment of so complex a problem, I propose to adopt Dr. Flugel's division of it.

Decoration: No serious student of clothing can escape the very obvious fact that the ultimate purpose of clothing is to add to the sexual attractiveness of the wearers by stimulating the sexual interest of admirers of the opposite sex and the envy of rivals of the same sex. But the sexual element in clothing does not stop here since certain forms of dress not only serve to arouse sexual interest but may actually symbolise the sexual organs. The most remarkable example of this feature of clothing was probably that peculiar article of dress worn by English men in the time of the Tudors known as the "cod-piece." Not only was the cod-piece a conspicuous sartorial device for housing the male genital organs when men's nether garments fitted very tightly, but attention to it was further evoked by its vivid or contrasting colour as well as to the practice of the insertion of padding in such a way as to imitate a penis in erection. A further function of decoration in clothing was that associated with inspiring terror in one's enemies. Primitive examples of this type of decoration are the wearing of scalps of fallen foes or necklaces of the teeth of one's enemies killed in battle.

A modern remnant of this 'terrorising' feature in dress exists in horizontal lines of braid worn by Hussars across their chests which, when associated with a skull upon the head-dress (as was worn by the Prussian "Death's Head" Hussars) may be taken as an attempt to represent the ribs of a skeleton. Mention of military uniforms leads naturally to another function of decoration namely the indication of the wearer's rank or office. Then we have the so-called 'national' dresses as well as those associated with certain political convictions such as shirts of various colours and hats

or caps of certain shapes. Well known examples of the latter type of decorative dress is the 'Gandhi' cap and the head-dress worn by the nationalists of modern Persia and Iraq. Another consideration of 'dress' is shewn in special modifications to enable certain essential articles to be carried about, *e.g.*, pockets and the uniform of a boy-scout with its belt on which hang the knives and other instruments of scouting. Not very long ago a European settler in Kenya colony considered it *de rigueur* to carry on the belt which maintained his 'shorts' in position, a key wherewith to open beer bottles. There remains only one more significant feature of 'decoration' in dress and that is of a rather subtle but nevertheless essentially psychological nature, namely, the attempt through sartorial arrangement to achieve an extension of one's bodily self. A notorious example of this is the function of the skirt in a woman or very voluminous trousers in a man. Instead of being supported on just two legs with nothing but thin air between them, a skirted woman or a man wearing the voluminous trousers of a Pathan, assumes much more ample and voluminous proportions. The skirts of a dancer add 'a kind and amount of motion foreign to our natural organs.'

Modesty: It is in this aspect of clothing that more has been spoken and written than perhaps in any other, hence it is rather disappointing to find that a good deal of what has been said and committed to writing has, so far from illuminating the topic, only increased the difficulties which surround it. The impulse of modesty may be aroused either by a predominantly sexual or a predominantly social situation. Among savages, social forms of modesty frequently require the actual removal of garments as a sign of respect. On approaching holy places such garments as are normally worn must be removed, *e.g.*, the discarding by Moslems of their ordinary garb on reaching the latitude prescribed for the assumption of the Ihram when performing the pilgrimage to Mecca. This costume consists for men of two cloths, one worn round the waist, the other over the shoulders. Nothing else is allowed—even a belt is, strictly speaking, prohibited. The introduction of Christianity into Europe produced some very remarkable repercussions on the concept of modesty in view of the rigorous opposition it upheld between the body and the soul. Christianity taught that attention devoted to the body was prejudicial to the salvation of the soul. Today girls in convents in some parts of Europe must not take a bath without assuming a special garment to protect themselves from lustful thoughts that might arise through seeing their own naked bodies. On the other hand, savage women who have been used to nakedness, *e.g.*, the Kavirondo of equatorial Africa, do become shy and embarrassed if a part of their body is suddenly clothed. Of course, in a sense, all modest conduct (like all

conduct whatsoever) must depend directly on physiological factors in the self. For instance, a person may feel that a certain kind of dress is *in itself* immodest, as when a puritanically minded person refrains from certain forms of sartorial display that are regarded by his neighbours as natural and harmless. Another emotion that has probably played a part in the history of dress is that of jealousy. A jealous and particularly an impotent husband, does not want his wife to rouse too great admiration in other men. This may be achieved by actually excluding her from male society as is of course, to a large extent, the custom in India. For this Islam has been mainly abused but neither the Qoran nor the Prophet can fairly be held responsible for this custom. The seclusion of Moslem women originated in the reign of the Caliph Omar, and was unknown in the early days of Islam. Further, it is not of Arabian origin, but derived from the Far East.

It is important to realise that modesty varies very much at different times and in different places. In my own boyhood it was considered highly indelicate to refer to a lady's legs, while in an earlier period a would-be donor of silk stockings to a Royal bride was rebuked for the indiscreet implications of his intended gift by the statement, "The Queen of Spain has no legs." In parts of Central Africa, the buttocks are the region on which shame is concentrated, a shame which, with the inhabitants of those parts, far exceeds that attaching to the external genital organs. Among Moslems there has never been any attempt to disguise the fact that men and women are bipeds. To them the face is the part of the body which must be covered. Modesty thus varies enormously in its anatomical incidence and may, theoretically at any rate, be distributed in any proportions over the various surfaces of the body ; while, in practice it usually applies principally to one or two out of a small number of well-defined zones.

Protection: The protective function of clothes might seem at first sight to be simple enough enough but as a matter of fact it is much more diverse and complex than many persons suspect. The most obvious form of protection afforded by clothes is that against cold. Nevertheless, we may find instances of human beings, for example, the natives of Terra del Fuego, who live quite naked in an intensely cold climate. Clothing can also protect against heat, as evidenced by the wearing of sun helmets in hot countries. Clothes can also protect us against enemies, both human and animal. The desire for protection against human enemies led to the development of armour and the modern steel helmet and gas-mask. Of the animal foes against which man has sought to protect himself by clothes, insects are probably the most important. Indeed, some writers consider that the wearing of clothes for protection against insects has played an important part in the

origin of human dress. But beyond protection from physical dangers or injury, clothes can reassure us against various imaginary dangers. Among such are the supposed influences of magic and spirits. Hence the production of charms and amulets to hang round the neck or to be fastened to the arms. Closely similar is the function of clothes as a protection against moral danger. Thus, a priest of the Roman Catholic Church protects himself in his plain but all-enveloping habit against the lures and temptations of this wicked world. As a protection against moral danger, clothing must be ample, thick, tight, stiff or unprovocative in colour, or, better still, possess several of these qualities. Thus it is that certain garments can become symbolic of inflexibility of character, severity of moral standard and purity of moral purpose. The porcelain 'top-hat' of the Korean gentleman is an embodiment of peace-loving and grave deportment. Clothes influence profoundly the thoughts and behaviour of their wearer. A Japanese naval officer told a brother of mine that when off duty he would discard his uniform and put on a kimono and thus attired amuse himself by making paper flowers. He assured my brother that he would be just as unable to indulge in this harmless pastime were he wearing his uniform as he could discharge his duties as an officer of a battleship dressed in a kimono. Soft collars are often thought unsuitable for business wear, the assumption being that their lack of rigid form betokens a corresponding 'slackness' in the wearer. A dressing gown and slippers, on the other hand, have become almost proverbial signs of ease and relaxation. Dr. Flugel cites what he regards as yet one more way in which clothes exercise a protective function, namely, a protection against the general unfriendliness of the world as a whole, in other words, a re-assurance against the lack of love. Whether we accept this view or not, it should not be forgotten that, speaking of his dead wife, Carlyle said, "She wrapped me round like a cloak to keep all the hard and cold world off me." Clothes, like our homes, protect us and being not only nearer our bodies than our houses but actually hung about them, we carry, like snails and tortoises a sort of home upon our backs.

Conclusion: We may conclude with a few remarks on the future of clothes. We must admit that the very existence of clothing for purposes of modesty or decoration implies that the conditions of our standard are but incompletely fulfilled, and that, in recommending this or that as a contribution to sartorial reform, we are guilty of striking a compromise, since ultimately our reforms must end by improving clothes out of existence altogether. This conclusion, it would seem, is after all not so very terrible. It is the kind of compromise that is implied in all art, and indeed in nearly all ethical evaluation of behaviour (as in the Spencerian distinction

[between absolute and relative ethics). Art itself (and with it sartorial art) is a compromise between imagination and reality ; it deals with real media but implies an inability to find complete satisfaction with reality, and creates a new world ' nearer to the heart's desire,' away from the limitations and disappointments of reality. In this matter, if we are guilty of compromise, we have at least sinned in the most respectable of company ; we have, in fact, only shown that toleration of human frailty and of the relativity of human wishes that all art postulates. Of such a compromise there is little need to be ashamed.

We must honestly face the conclusion that our principle points, ultimately, not to clothing, but to nakedness. Here also we are not alone, and our company, if less numerous, is at least worthy of consideration. Apart from the (in some countries) very numerous practitioners of nude culture and its semi-official spokesmen, there have been several other writers within the last few years who have anticipated us in this conclusion. The ' Men like gods,' who inhabited Mr. H. G. Wells's Utopia, were naked. Mr. Gerald Heard as the result of his philosophical and historical survey, considers that clothing is destined to vanish from the earth. More recently still, Mr. Langdon Davies, taking Giodiva as his patron saint, leads us with much eloquent persuasiveness towards the same view as to the ultimate inevitability of nakedness. The boldest of all prophets is Professor Knight Dunlap, who believes that nakedness will be at first a uni-sexual affair, but holds that ' within a few years ' women at least will expose the whole body in public, and will cause but little commotion by so doing.

Encouraged thus, we may with greater equanimity contemplate the possibility that dress is, after all, destined to be but an episode in the history of humanity, and that man (and perhaps before him woman) will one day go about his business secure in the control both of his own body and of his wider physical environment, disdaining the sartorial crutches on which he perilously supported himself during the earlier tottering stages of his march towards a higher culture.

Meanwhile the crutches are still with us. We can, however, at least see to it that our budding science shall enable us to fashion them efficiently and use them well, and so let them help us further along the road. But the first state of applied science must consist in an honest review of our present position and a reconnoitring of the path of future progress. These are the humble but necessary tasks on which we have been occupied.

PERCEPTIVE INDIVIDUALISATION

P. T. RAJU

Introduction: The problem of perceptive individualisation is as important in epistemology as in psychology. Most of the endless controversies about determinate and indeterminate perception and allied topics in epistemology can find an end only when approached from psychology. A question like "which is prior, the cognition of the universal or that of the particular?" cannot find a final answer from the *a priori* reasonings of philosophy alone. In the perception of a pen, for instance, if it is said that the particular is perceived first, it may be objected. How then can it be perceived as a pen? For without the knowledge of the universal we could not have known it as a pen. If it is said that the universal is known first, it may be then asked, how can any one perceive the universal without perceiving the particular? If, on the other hand, it is contended that both are seen together, the question may be asked whether the universal is an object of perception at all. For every answer thus there can be an objection and the doctrines held on this point are of so far-reaching importance that they colour the philosopher's views in logic, ethics, metaphysics and all other sciences which are based on them.

It is also held that the individual is a combination of the universal and the particular. The subject at first perceives the particular, which as such can be no definite object. Only when it is brought under a universal can it be something definite. Otherwise it is a mere *That*. But the priority of the universal and the particular cannot be determined logically. Again logically it is impossible to answer the question whether the universal can be perceived. The universal belongs to thought; then how can it be perceived? If a universal cannot be perceived, can a complete individual be fully an object of perception? Is the individual partly an object of perception and partly an object of thought? Are we to check our doctrine of perception with the help of metaphysics or with the help of psychology? It seems that the problem has to be studied psychologically and our theories of perception based on that study.

A separate psychological apparatus and procedure do not seem to have been invented to determine whether and how the universal is perceived or cognised. But good work has been done particularly by the *gestalt* psychologists on the problem of the perception of the individual. The individual so far as psychology is concerned is what has definite and

completed form. The experiments of the gestaltists therefore, with the aid of our general experience must solve for us the present problem.

Individual and its form: All psychologists accept that perception individualises its object; but they differ in their views on how this individualisation is accomplished. Henri Piéron writes: "The general law of what we call *perceptive individualisation* is that all sensory experience gives place normally to perception in which it permits an object or a situation to be individualised so as to adopt a definite form of attitude or conduct to it."¹ Piéron does not take the help of universals to individualise an object. According to him a group of sensations is treated as an individual when their togetherness is maintained in a changing environment.² There is at first no individual. The group of sensations which is to be later treated as an individual are given together with their environment in one mass of what Ward would call the presentational continuum, which through analysis aided with purposive action and language becomes later the individual and the environment. In this process objective factors like the colour of the objects, their brightness, extension, form, distance, relief, movement and speed also help us.

In reading this account given by Piéron one doubts whether the inclusion of form among the physical factors that determine individuality is as really undisputable as it may at first appear. What is really the difference between the individual and its form? A philosopher may at once answer that the form is the universal, that all the other factors, physical, physiological and psychological, are only aids for throwing this universal into relief, so that the object concerned may be recognised as so and so, that is, as an individual flower, pen and so forth. But as psychologists who are rather empirically minded, we may hesitate to rush to that conclusion. Piéron's account of form is not so clear as to enable us to see whether he means by it a universal or a particular. The way he includes it in the factors that help determining individuality suggests that he means a particular by it. However, without referring to his views in particular, we may ask the question whether a form should necessarily be universal and what the difference is between the form and the universal.

Stout writes: "Forms of combination can be concrete and particular like the elements combined."³ On the other hand, he also holds the view that no object is perceived without at the same time perceiving it as an example of this or that universal. He says: "Whatever is perceived is

¹ *Principles of Experimental Psychology*, p. 104.

² *Ibid.*, p. 70.

³ *Analytic Psychology*, Vol. I, p. 65.

recognised as such or such; and however vague and rudimentary the recognition may be, it implies a reference to something beyond the given object. The object comes before consciousness as an instance, or example, or particular appearance of something which may have other instances, or examples, or particular appearances."¹ This latter is the view that any object is known as an individual only when it is brought under a universal. The particular, we may say, is what corresponds to the *that* in the judgment. "That is a pen," the universal is the predicate pen, and the individual is what corresponds to the judgment as a whole, that is, the object specified as a pen. Unless it is specified as a pen, it cannot be seen as a pen, that is, as having the form of a pen. To see it as having the form of a pen or as belonging to the class pen is one and the same act.² Hence Stout's contention that there is no perception without recognising the universal in the object.

If we are to understand Stout thus, how are we to reconcile this view with his other that the forms of combination can be particular? If these forms can be both particular and universal, how are we to differentiate the forms that are particular from those which are universal? On the whole Stout should be interpreted as holding the view that form must be universal. He accepts the association hypothesis. Of course he does not mean that we first have sensations and then combine them according to certain forms. In his *Manual of Psychology* he writes: "It would be better to say that the mind's knowledge and practical dealings with material things is the first thing in the way of experience. In the course of such dealings the mind is compelled to distinguish between the subject as it independently exists and its own sensations, which exist only as part of its life history and its own immediate experience. When this distinction is drawn, the mind may come to see that its prior knowledge of other things was in fact conditioned by sensations which it had at first failed to distinguish from the object apprehended."³ That is, only when the mind begins to reflect on the process of its perception does it discover sensations, and then when the question is raised how a material object is perceived, the problem of the association of sensations crops up and the mind treats the object as a combination of sensations. But this association is not merely association but what Stout calls noetic synthesis.⁴ The difference between the two kinds of synthesis he puts thus: "In any given stage of a train of thought the next step is partly determined by the controlling influence of the

¹ *Ibid.*, Vol. II, p. 6.

² Here we need not distinguish, for the present, between the class and the universal.

³ P. 121.

⁴ *Analytic Psychology*, Vol. II, p. 3.

central idea of the topic with which the whole series is concerned, and partly by the special idea which has last emerged. In so far as it is determined by the special idea which has last emerged, the principle of association is operative; in so far as it is determined by the central idea of the whole topic, noetic synthesis is operative."¹ In the construction of thing out of sensations it is the latter synthesis that is operative.² But what is this central idea? It is the universal. In every object which is thus a construct the universal is implicit. Stout writes: "All thought implies a universal; and a perception is a thought. At the least, it implies distinction and recognition, and so carries with it a reference to an object which remains the same in its varying appearances. The transition from the percept to the concept is not a transition from the merely particular to the universal. The difference is rather this: in perception the universal and particular are indistinguishably blended; the universal element lies entirely in the bare fact that the particular is recognised. Now the essential character of conception is that in it the universal is thought as such, in contradistinction to the particular; implicit in the percept it is explicit in the concept."³ The central idea in the noetic synthesis is the concept implicit in the percept. He says: "By noetic synthesis I mean that union of presentational elements which is involved in the reference to a single object; or, in other words, in their combination as specifying constituents of the same thought."⁴ Here we are left in no doubt about the fact that, according to Stout, the form of the noetic synthesis is the concept which is the universal. In getting the percept of a pen, for instance, the form in which the various elements of the percept are synthesised constitutes the universal pen. If so, one is justified in asking: 'How can this form be particular? It is true we distinguish between the form of an object and its matter. This form is really the shape of the object, its figure, which is treated also as a primary quality. If we treat it as a quality, then as every quality is an object of some sense, and as sense gives us only particulars, then shape, figure, form or *gestalt* must be particular. But how does an object get its form? Only when its elements are combined in that form. That is, its form would really be the form of the noetic synthesis. But then how can it be a particular or a quality?

Opposed to Stout's view is that of the gestalt psychologists, according to which the form is undoubtedly particular and concrete. Koffka writes: "To an adult, a configural function, in its phenomenal aspect, is a perceptual experience in its own right; for it is neither a mere judgment, nor

¹ *Op.cit.*² *Ibid.*, p. 1³ *Ibid.*, pp. 173-4.⁴ *Ibid.*, p. 1.

mere apprehension of sensations."¹ For the gestalt psychologists the universal does not enter into perception in order to bestow upon it a form. Therefore a percept need not be a thought or concept as well, and so every perception need not be a judgment. That is, the form of a thing can be perceived without at the same time a universal operating in the process. This is true not only of the forms of spatial or plane figures but also of things. For instance a thing like an orange is perceived as a whole. It contains several sensations. In the same perception the orange does not show all its sides; so even its visual figure must contain several parts. Then there are sensations of taste, smell, etc., which its visual perception certainly *means*. All these sensations are grouped together in the *percept* of the orange. One may say that in the visual perception of the orange we do not have the other sensations, though when we speak of the thing orange all the sensations may be included. Yet even in the visual perception the orange is seen as an individual, though its individuality is enriched when it is perceived as containing smell and taste. In both perceptions we have a unity of sensations, but in neither perception is the unity produced by any higher mental process. That is, the form of a group is what belongs to that particular group itself, and is not something which the group contains through the process of mind, which is said to bring the constituents together. Köhler says: "As so-called optical illusions show we do not see individual fractions of a thing; instead the mode of appearance of each part depends not only upon the stimulation arising at *that* point but upon the conditions prevailing at other points as well. Since this fact does not bear out the assumption of isolated excitations, its explanation has been sought in terms of 'higher mental processes.' And yet had it not been for this assumption probably no one would have thought to maintain that visual 'Gestalten' occur only as products of mental activity."² If the form is due to mental process it must be universal. But, this school contends, it belongs to the objective elements themselves. For the gestaltists there is really no occasion for association or noetic synthesis, because the elements themselves possess that form. The form of a group of elements is determined by the peculiar nature of the elements themselves. The form of one group of elements, therefore, must be different from the form of another group. For, Köhler contends, the form or appearance of any part depends on the conditions prevailing in the other parts. As Wertheimer puts it, "the given is itself in varying degrees 'structured' (*gestaltet*), it consists of more or less definitely

¹ *The Growth of Mind*, p. 318.

² W. D. Ellis, *A Source Book of Gestalt Psychology*, p. 20.

structured wholes and whole processes with their whole-properties and laws, characteristic whole tendencies and whole determinations of parts. 'Pieces' almost always appear 'as parts' in whole processes."¹ There are various factors which produce these forms. They are proximity, similarity, direction, uniform destiny, closure, etc.² The inclusion of factors like similarity need not worry the logicians here, who may think that two things are similar when they have something identical, which existing in more than one place must be a universal. But the gestaltists would say that the parts which are said to be similar may be apprehended separately; that is, their individual forms are first cognised and then their similarity is noticed. It is not that mind first perceives similarity and then brings the similars into one configuration but that the similarity is known after they enter the configuration. The universals are concepts which are certain configurations of our wider experience.

We have thus two opposite views: one that of Stout according to which there is no percept or individual without a universal, and the other that of the gestaltists according to which the individual as a particular is perceived without the help of a universal. We have strong reasons in support of both. We have the old controversy again though in a different form, namely, whether the universal is obtained by abstraction from the individual or whether it constitutes the individual. For Stout the universal constitutes the individual. Perception is a form of thought; so there is no percept without a universal. Of course, the universal is only gradually liberated from perception; yet it is implicitly there from the very beginning. He tells us indeed that a form can be as particular as the content. But it is difficult to understand how this view can accord with the rest of his theory. We have probably to understand that in simple apprehension the form is at first perceived as an individual though later on it will be discovered to be a form of the noetic synthesis of sense material. Stout refers here to Ehrenfels' *Gestalt qualitat* and points out that this form is different from Kant's forms.³ But how, in his theory, the form can be particular is the problem. For instance, in the same connexion he writes that "the form of a whole may remain the same while the parts vary; further, the variation is of such a nature as to exhibit the relative distinctness and independence of the form of composition on the one hand and the sum of the components on the other."⁴ But obviously if the form can remain the same even when the parts vary, it must be universal. And again if it is the form of noetic synthesis, it cannot but be universal.

¹ *Ibid.*, p. 14.

² *Analytic Psychology*, Vol. I, p. 65.

³ *Ibid.*, pp. 71 ff.

⁴ *Ibid.*, pp. 69-70.

One may probably meet this objection by distinguishing between the objective form and the subjective form of synthesis. Even then according to Stout, the object as a percept must be a unity of the particular and the universal. Then only does it possess a form and appear as an individual. What else can this universal be but the form of the object? The object can be an individual only because of the form, whether the form be subjective or objective.

When we have two conflicting views which are equally strong, it is only some crucial instances that can decide the issue. Abnormal psychology has helped a good deal in solving the problems of normal psychology. Similarly it is exceptional cases of perception that can help solving the cases of normal perception and form the crucial instances. We may therefore take cases like illusions, the first perceptions of new objects by adults and children, experiments on perception contrived to throw some factors into relief, and pathological cases.

Percept without universal: The upholders of the doctrine that perception is thought contend that the operation of the universal in all perception is through recognition or reproduction. Stout writes: "Whatever is perceived is recognised as such or such; and however vague or rudimentary the recognition may be, it implies a reference to something beyond the given subject."¹ But when I perceive a pen, during that process of perception, do I have any general idea of pen before my mind with the help of which I understand the object in front of me? This is a question of introspection. Personally I feel that I have nothing before my mind except the object. I have no experience of any idea besides the object. An idea we need not understand here in the sense of an abstract universal. It may be even an image, in which sense it is often used by psychologists. So much is admitted by Stout himself, who says that this recognition "does not commonly involve the ideal recall, either of other appearances of the same thing, or of other appearances of like things. If I look at a horse I immediately know it for a horse, without summoning mental images of other horses." But then where is recognition in simple perception? If I make the judgment, "That is a horse," meaning thereby that the object in front of me belongs to the class of horses, that is, when I make a classificatory judgment, I may be making use of a universal. But when I simply perceive the horse without caring to classify it, it will be difficult to understand where the universal comes in. It may be asked how I know it to be a horse without bringing it under a universal. The *tu quoque* for this is, Why does the universal horse come before my mind and not some other

¹ *Ibid.*, Vol. II, p. 6.

universal if the object in front is not already perceived as a horse before it can be the occasion for the universal horse coming up before my mind? Stout's theory implies that at first we have sensations of colour, extent and so forth; then the universal horse is consciously or unconsciously remembered; this gives the sensations and individuality; and I perceive the individual horse. But the whole process is so spontaneous that I am not conscious of it, but only of the object. What is difficult to understand here is why the universal horse comes up before my mind and not the universal ox when I perceive the That. The only reason can be that the individual horse itself is perceived first and not a mere That. Then it may (of course, it may not also) occasion the appearance of a universal in my mind.

This difficulty was brought to light by Hegel long ago while examining Kant's theory that the pure manifold of sensations was unified by the mind through the forms of its experience and constructed into the phenomenal objects we see. Hegel asked: How could the alien forms be imposed on the pure manifold if really the latter itself does not possess the forms? And if the manifold does contain the forms from the very beginning, that is, if the forms are as particular as the manifold itself, where is the occasion for the mind to impose its forms on the manifold? Really the theory that every percept is the recognition of a concept, explicit or implicit, is due to the interpretation of perception as a judgment like "That is a horse." But this judgment is ambiguous. It may represent simple perception or it may be a classificatory judgment. The latter certainly uses a universal but not the former. In the latter the predicate is an idea, but in the former it is a percept. We cannot but say that language is misleading here.

One may not be satisfied with logical arguments. We shall take, therefore, psychological evidence into consideration. Köhler has already brought to our notice optical illusions which cannot be said to be perceived part by part and then individuated, but which must have been perceived as individuals or wholes—which shows that the parts are not grouped together according to a universal but according to their objective properties. The whole thus formed is a particular individual and is as such perceived. In the simplest of Müller-Lyer illusions in which two lines of equal length are enclosed between arrowheads turning inwards and outwards respectively, the latter is seen to be longer than the former. One may be seen after the other. Yet the idea which the first perception leaves has no influence on the second—which shows that a percept may be uninfluenced by a concept.

More complicated experiments were performed by the gestaltists to decide the question how far past experience should be taken as constituting

the present experience. Recognition implies reproduction or reintegration. In the experiments carried out by Gottschaldt we find that where the figure is simply repeated, or where the old figure is included in a new one which does not possess a good gestalt of its own, there is recognition. But where the old figure is swallowed up in a new gestalt there is no recognition or it is very rare. These experiments show that every new picture is understood in terms of its own gestalt and there is no invariable reproduction. We may, therefore, say that every thing or percept is understood in terms of its own individuality and not in terms of a universal. That is, the percept need not contain a percept or universal in order to be perceived as such.

It is still more difficult to point out a universal in the first perceptions of children and adults. Generally it is children who have many first percepts. It is they who often come across things for the first time. In the case of adults this does not happen often. But in either the problem is the same. Because we perceive a thing for the first time, are we to think that there is no percept formed as there can be no recognition in it? A Platonist may make use of mythology here. He may say that the soul in some previous existence has knowledge of all possible ideas, and even when a thing is seen for the first time it is not really new but reminds the soul of its previous experience in the light of which the present object is understood. But no modern psychologist will accept this Platonic myth. We have then to say either that the first percept is no percept because there is no reproduction, explicit or implicit, in it, or that it is a percept and so a percept can be had without the help of a concept. But it is unreasonable and contradictory to experience to say that the first percept of a thing is no percept.

Another evidence in favour of the view that a percept can be had without a universal is the pathological case in which an individual can be seen as such but cannot be recognised. Stour refers to Charcot who reports a case in which "the power of recalling visual imagery was almost entirely lost though visual perception was by no means proportionately affected."

Complex percept: But one may ask: If no image or idea is made use of in perception, how can we form a complex percept like that of a cube? When I perceive a cube I do not perceive all its sides. I see three of its six sides and the other three I supply from my imagination. So even the first percept of the cube must have been formed with the help of an image or an idea. But this objection assumes that the sides not seen are images of sides. And these images together with percepts of the sides constitute the percept of the cube. Now, can percepts and images together constitute the total percept? Can an image be added to a percept? In the total percept the percepts of the three sides seen are really three impressions. It is difficult

to understand how impressions and images or ideas together constitute a concrete whole. As psychologists we may say that this is not a question of understanding but of experience. Even then what does our experience reveal? In the total percept of the cube the sides unseen are as concretely experienced as the sides seen. We may not see the colour of the unseen sides, they may contain depressions while the seen sides do not; yet the impression of form is equally definite in the case of both. One may wonder how the impressions of the unseen sides are produced when our senses are not affected by them. We should say that they are centrally excited or psychologically or subjectively aroused. They are not indefinite like images but definite like impressions. They are definitely localised in a definite whole. The blanks in the whole should therefore have been filled according to the laws of gestalt. They cannot be said to be even indefinite sensations like the film colours noted by von Frey.¹

Ward writes: "Yet it is saying too much.....to describe a percept as a presentative-representative complex, if representation is to imply the presence of a free or independent idea. To call the representative constituent of the percept a 'tied or nascent idea' on the ground of its possible later development into an independent one seems, then, nearest the truth."² The tied idea here is the unsensed part of the percept; it is tied to what is sensed. The word tied must mean spatio-temporally fixed. What can this be but an impression or definite sensation, the nature of which is to a large extent determined by what is actually sensed? When I, for instance, look at the chair before me and then close my eyes and picture it, the unseen part is not more indefinite than the known part. And in the percept the unseen part occupies as definite a space as the seen part does.

It may now be doubted whether a sensum can be supplied by mind. The general belief is that mind can supply only images and not sense or impressions. To remove this doubt we may refer to dreams. The objects seen in dreams are not unsteady images, ideas or universals of things but definitely fixed percepts with all the wealth of sense qualities which percepts of waking life possess. Yet the dream percepts are not real objects exciting our sensations. Further, in the illusion of a snake in a rope all the sensations that constitute the percept of the snake are not excited by the object in front. Only one or two sensations that are common to both the rope and the snake are objectively aroused; the rest must have somehow been supplied by mind itself. The snake is not a mere idea but a real percept. It is not a 'free' idea as Ward would call it, but a localised

¹ W. D. Ellis, *A Source Book of Gestalt Psychology*, p. 202.

² *Psychological Principles*, p. 185.

or tied something. The view that the object of illusion is only an idea and not a percept can only belong to a superficial understanding. Nobody is affected by an idea but by a percept. Only because the snake is experienced as a percept that the perceiver is afraid of it. If for these reasons we have to take the snake as a percept, it is proof enough that mind can supply the impression for completing the individuality of a percept.

Again, Stout contends as against Ward, that impressional revival is possible.¹ In evidence he writes: "Some persons can summon up mentally so vivid a presentment of colour that the negative image follows, as if the colour had actually been before their eyes. J. Müller vouches for this fact, and A. Binet, in his *Psychologie du Raisonnement*, reports a number of cases. It is difficult to suppose that such after-images can arise otherwise than by a previous excitement of impressional centres."² So as impressional revival is possible and can also be adapted to any percept as in hypnotism, in which a percept can appear in any way suggested, there is absolutely no difficulty for mind to supply the impressions of the unsensed part of the percept. Moreover, Stout maintains that impressional association is possible without the association of ideas and that when an impression is reproduced, the reproduction need not be affected through an idea.³ This further supports our contention.

In the above discussion we have used the words form, whole, figure, gestalt and individual in the same sense, and again the words universal and concept in the same. It is true that the word form has various connotations and denotations in the history of philosophy. It is used in the sense of whole, figure, and the universal. We have referred to Stout's distinction between forms that are particular and those that are universal, and have pointed out that this distinction can only be one of degree but not of kind for him. For the form later made explicit or ideally detached from the percept becomes the concept. In the philosophies of Locke and Descartes, for instance, form of figure is a primary quality and is consequently particular. This is the spatial figure. But the important point for us to note is that for these philosophers space and time were the principle of individuation, so that figure which was spatial and occupied a certain duration of time was the individual. The problem then is whether individuality is only a quality, though a primary one, of the thing and whether individuality does not include the idea of substance as well. This difficulty does not seem to have occurred to those philosophers.

¹ *Analytic Psychology*, Vol. II, pp. 11 ff.

² *Ibid.*, p. 12.

³ *Ibid.*, p. 29.

However, the point of our present interest is that even for them form or figure constituted individuality. By the gestaltists form is used in the sense of the whole also. This usage agrees well with idealist philosophy. According to Bradley and Bosanquet the individual is the whole, and the true universal or what is called the concrete universal by them is the individual.¹ The contention of the present paper is that every percept is the percept of an individual, and a percept need not presuppose a knowledge, explicit or implicit, of the universal or concept.

As regards the words universal and concept, they are used in the same sense in this study. This usage is after the psychologists and implies no reference to the theories of realism, conceptualism and nominalism. We are here concerned not with the metaphysical status of the universal but with its function in human mind. Psychologically, it must function, if it functions at all, as a concept. Following Ward and Stout we have used the words image and idea without distinction. In the psychological evolution of the concept the stages may best be represented by percept, image and idea or concept. But so far as the present problem of reproduction is concerned, the latter three may roughly be said to play the same rôle. If really every percept contain a concept, the function of both image and idea must logically be performed through the concept. But if, as this paper contends, a percept need not contain a concept, all the three may equally be excluded from the percept.

The principle of wholeness and the universal: So far we have been trying to show that in percepts like that of a horse, chair or pen, no past experience of any of these and no universal horse, chair or pen need be involved. Even when there is no doubt of the reality of the percept and the perception is of the form, "That is a horse," "That is a chair," or "That is a pen," which asserts the existence of the individual horse, chair or pen, a concept or universal or any past experience need not have functioned. So far we have supported the gestaltists. But we have admitted that every percept is complete, whole or individual, and that all impressions necessary for completing the whole cannot be objectively produced. In the perception of a cube only three sides are actually sensed, and then three other impressions are subjectively supplied. Similarly in the visual perception of "sweet sugar" or "cold ice" the impressions of sweet and cold are supplied by mind. In all these percepts the principle of wholeness or rounded totality or individuality is operative. We may now raise the question whether this principle is not a universal. When, for instance, mind supplies the other three impressions in order to complete the cube,

¹ Cf. Bosanquet, *Principle of Individuality and Value*; Bradley, *Appearance and Reality*.

the whole percept of the cube may be said to be composed of impressions and to be therefore a particular individual. But why does mind supply the unseen sides of a cube and not the unseen part of a cylinder? So mind in its activity must have been guided by some principle in the construction of all its percepts. Is it not right that we treat this principle as a universal? This principle must have been used even in the first perceptions of things. We have really no evidence to show that in the first perception of a chair by a member of the hill tribes the concept or image of chair is used. But the principle of individuality or wholeness must have been used by him even then. Hence does not every percept involve a universal?

A complete answer to this question requires that a separate article should be written. Yet we may say for the present that a negative answer to it seems to be impossible. But this admission in no way imperils the position maintained in this paper. For there are universals and universals. The principle of individuality is not a specific universal like that of chair or cube. By many philosophers the distinction is made between empirical universals like chair, pen and horse and non-empirical universals like unity, plurality and causality. The forms or categories in Kant are non-empirical universals. The contention of this paper is that all percepts need not contain empirical universals or concepts, which therefore need not have guided mind in all perceptions. Even in the second and later perceptions of an object images and ideas may or may not operate. The reason why I see a chair and not a table lies in the object itself. But the reason why I see a solid chair and not a plane figure lies in the universal or principle of individuality or wholeness, which must have guided mind in the formation of the percept. Even in percepts in which the stimulus is far less complete the same principle is operative. Similarly is the mind guided when it has an equivocal stimulus. The defect of the gestaltists lies in not recognising this distinction. Spearman's criticism that the gestaltists confuse between the subjective and the objective must therefore be true so far as this point is concerned.¹ But Stout and others who speak of the implicit presence of a concept in a percept do not mean merely the presence of a non-empirical universal but that of a definite empirical universal.²

ANDHRA UNIVERSITY

¹ *Psychology Down the Ages*, Vol. II, p. 441.

² The point needs further discussion and will be dealt with in the next paper.

Short Communications

THE RELIGIOUS DEVELOPMENT OF THE CHILD

R. M. LOOMBA

Psychologists have now for many years been engaged on the study of the psychology of the child. But it cannot be said as yet that we have acquired absolutely accurate and scientific knowledge regarding the religious development of children.

Still, it can now hardly be doubted that religion has a very close and intimate relation with the mental world in which the child's life is lived, possibly much more than with the mental world of the adult. For to a child, religion is something tremendously serious, indeed truly holy. And, on the top of this, it is completely incorporated and assimilated into the child-world. Although, to the adult, the child seems to be only playing with religious objects, yet, to the child himself, they are realities, intensely real, occupying a very central place in the world he lives in. The little Lord Krishna in wax, the clay-cows and the wooden milkmaids are all to him real things to which the customary laws of wax and clay and wood of the adult-world do not apply at all.

But one hypothesis, often suggested from a certain quarter, has been thoroughly disproved. A study of the religious ideas of early childhood does not support the notion that they are in any way intuitive or necessary. There is no such thing as a religious instinct leading the child on. It is wrong to believe that heaven in any religious sense lies about us in our infancy, that childhood is an age of innocence in which there is something peculiarly favourable to religion. The idea of God is not native to the child's mind.

Yet, in a sense, investigators of child psychology are agreed that the genesis of religious feelings in the child is spontaneous. Spontaneously, to the child, the external world appears to be by no means what it seems. The child experiences it as a place of wonder and mystery, full of strange voices and peopled by unseen powers. Everything is experienced as alive. Dolls and toys, it seems to the child, can speak and act like living beings. Pet animals are almost human. And inanimate objects are invested with the powers and qualities of life. At the least, all things are supposed to be controlled by some superphysical power. In the mind of the child, even before he has received anything amounting to religious instruction, even

about the age of between 2 and 3, are raised questions suggestive of this implication, questions of the type, "Who put the leaves on the trees?", "Who made the sun?", and the like. Similar questions implying authorship are raised concerning the origin of clouds, rivers, mountains, stones, etc. And all such questions bear an implication of a supernatural origin which is evidently spontaneous and uninfluenced by religious instruction. The causal explanations given or expected by the child are fundamentally motivations. Causality, in his mind, presupposes a 'maker.' And the causes of phenomena are identified with the intentions of the creator of mountains and rivers and everything else. These reasons and intentions the child is always trying to find out. Instead of looking for physical or logical explanations, the child tries to draw upon an "inner model" that may explain and account for everything.

The conception of a first final cause and of a unitary cause underlying all existence also arises spontaneously before the child has heard of God at all. Thus, a girl of 4 years and 2 months is reported to have asked, "Who was with me when my mother was little?" The mother replied that she had not come yet and that when the mother was little she was with her own mother, the child's grandmother. But then came the question, "Who was with grandmother when she was little?" "Your great-grandmother," was the answer. The child, however, still persisted, "And who was with all mothers?" The conclusion is obvious.

This tendency in the child is original and is characteristic of its mentality. It is a spontaneous trend of mind in children which penetrates deep into their emotional and intellectual life. Moreover, it is not heterogeneous among them. On the contrary, it obeys certain uniform laws of development belonging specifically to childhood. Firstly, children of the same age show all of them the same type of religious attitude, beliefs and conceptions. Secondly, the religious attitude, beliefs and conceptions of the child exhibit a progressive evolution which clearly shows their partially systematic character.

But the child's real spontaneous religion with which the child starts on this path of progressive evolution is very different from the overelaborated religion which is taught to it when it advances in age. It begins by endowing its parents with all the distinctive qualities which theological doctrines assign to their gods. Perfect sanctity and virtue, supreme power, omniscience, and even omnipresence are all vested in two persons, the parents. So it is the parents that are the objects of the earliest religious feelings of the child. The parents are virtually his gods.

But there is a limit to this deification of the parents. In course of time, the child must cease to regard them as perfect. Accordingly, the

powers and qualities ceded to parents so far come to be progressively attributed to more men or elder men or an early or distant unknown man. In this manner, the conception of the omnipotent and all-knowing object of religious feeling which is believed to have created all things is widened out of the narrow particularity of the parents. It is now not these two persons, the father and the mother, but man in general, "some man," who is taken to be the all-knowing, all-powerful creator of all things. There arises a powerful tendency to refer the making of material objects to a man. The sun, the moon and the sky are all attributed to the activity of some man.

Gradually, then, comes in that most important external factor contributing to the religious development of the child namely, religious education. It starts with the operation of the immense power of heredity, tradition, family environment, suggestion and propensity to imitation. And it first of all supplies the child with a name for the all-knowing and all-powerful being who has created all things. This name is God, with all its equivalents and incarnational versions.

The first reaction of the child to the religious education offered by these influences is hardly favourable. The notion of God appears as something being imposed on him and yet as something unnecessary, useless and embarrassing. Moreover the insistence on the perfection of God on the part of these influences implies the setting up in the person of God of a rival to the parents or other probably imaginary stronger human beings like them who already occupy a very sacred position in the child's consciousness.

In course of time, however, the child adopts the name God, transfers to the object denoted by it the qualities of omniscience and omnipotence he had so far attributed to parents or other men. He then starts on to expand and clothe this conception in ways easily determined by teaching and environment. These factors now find an easy and instinctive response in the normal child on account of the already developed spontaneous but rudimentary form of religious consciousness described above. Children seem to find some response in themselves to religious ideas even though these ideas may be beyond their intellectual comprehension. For the mind is already prepared to receive them with its nascent mental processes. To it there is nothing absolutely strange about the idea of angels or spirits or a God unseen but all-seeing. They easily fit into his scheme of things, and generally speaking, they believe what they are told about them. They make room for the idea of God when it is suggested.

But the concept of God in the mind of the child remains still that of a human being. Here, as in other fields, its mind still works through

pictures, images, and fantasies suggested by every-day experiences. So, when the child speaks of "God," it is a man that its mind pictures. And, therefore, it is that picture of a human being that is all the child's definition of God at this stage. God is, then, "a great strong man." As one child puts it, "God is a man who works for his master." Another child would describe God as "a man who works to earn his living," a third as "a workman who digs." In short, God is just a man like other men. The more advanced and spiritual religion of mature age has not yet dawned. The ground is still being prepared for it.

Fear plays quite an important part at this stage of the religious development of the child. For the child is already accustomed to the contemplation of the fearful, the dark, the shadow, the uncanny, the unusual and the unknown. And the appeal to God as the fearful and the likely cause of punishment and misery receives a ready response. But its spontaneous first effect on the child's mind is not awe as it is in the case of adults. Among normal children, the first effect of fear is not awe but curiosity. The child instinctively tries to familiarize itself with the strange object or experience, and the familiarity breeds confidence and friendliness. This becomes strikingly noticeable among those communities whose religious system includes a Satan or devil or some other evil spirit. Their children have been observed to be greatly interested in this evil spirit or Satan. They feel sorry for him, sympathise with him and are inclined to be quite friendly with him.

An equally important factor which plays a part in the religious development of the child at this stage is the mimicry as natural to the child as it is to the monkey. Anything solemn, orderly and formal appeals to the child irresistibly. Consequently, at a very early age, the child is found reproducing all the actions and attitudes of adults in worship and religious ceremonies. In fact, the rituals of religion become favourite subjects of the child's play and are carried through with immense solemnity and careful attention to details. The child's religious play exhibits an implicit acceptance of form and an idolization of the external associations of religion that is fundamentally characteristic of this stage of the child's religious development. The evolution of the inner and spiritual character of religion has yet to come.

The pure externalism of this stage further manifests itself when during the period of 5 years from 4 to 10 years of age God appears, alternatively with man and machines, as the earliest explanation of the cause of wind, sun, swift flow of the river and other grand phenomena of nature. Thus, the river is swift because God wanted it to be. The making of the sun and the moon are also attributed to him. Likewise wind is explained as

caused by blowing coming from God, who makes it come with his mouth. Sometimes it may be supposed to be due to the breath of gods. Or it may be supposed to be a creation by God. Thus, the wind may be supposed to come from the North wind, which may be supposed to come from God who makes it by whirling a stick round.

When the child gives such an elaborate pictorial explanation as the last mentioned, he is generally quite conscious, if once the question is raised at all, that he does not really believe it but is trying to somehow make out a fictitious story which may have the semblance of an explanation. Now if you persist in asking him how he really believes God produces the wind, he will just make up another alternative but equally fictitious story. Because the child really does not know what the real explanation is, how God must actually be producing the wind. And yet he must give an answer to satisfy your persistence in asking it. So, for instance, the child may say that God makes a hole in the vault of the sky and the wind flies away from within the sky through this hole on to the earth. The child thus may give the central idea of the divine causation of the wind any elaboration. He may sometimes say, God makes the wind with fans. Or he may say, God does it by bending the trees and making them move so that there are lots of wind.

Apart from the question as to the manner in which God makes the wind blow, the child of 1.6 also attributes certain motives or purposes to God's act of producing the wind. Some of these purposes he has merely received from elders like the father. Thus he may adopt the explanations given by the father that it should rain so as to break off the branches for a fire. But he does not really believe such an explanation. And since he believes it to be really as good as fictitious he can himself spin out other similar explanations. He thus may say, as one child is reported to have said, that the purpose of God's making the wind blow is that it may make lots of little waves in the water and may thus push the little boats so that one may not need to row. The variety of all these explanations of the manner and the purpose of God's creation of the grand natural phenomena suggests, however, that there is an element common to them all—the divine origin—which is really believed by the child, while the rest, the elaboration of the common theme, consists merely of fictional embellishments which the child adds to his real convictions under the presence of questions and cross-examinations, whether by another person or the child's own curious mind.

Of course there is one thing which all these explanations fairly make evident. The child's explanation of the manners and motives of divine causation of the grand natural phenomena is derived either from daily

technical experience, as when it refers to sticks or fans or fuel, or from the child's knowledge of the ways of natural causality, as when it refers to the movement of trees or the pushing of the boats by the wind. An American child in a school at California is reported to have explained God's causation of the Sun by imagining a great and strong man called God hidden behind the hills of San Francisco who threw a fiery ball into the sky. The wind was explained as God's passion, a cold gale as his anger, a cool breeze as his happy temper and the fog as his breath in the cool morning. The floating clouds were supposed to be the lungs of God. And the child is reported to have exclaimed, "How strong lungs the god has!"

That religious development does take place in the child apart from the religious education which starts at about this stage of life and only receives a name from, and assimilates itself into, the received system of religious teaching is also testified to by the fact that concepts like that of the first cause may grow up independently of and unaided by teaching imparted. Only, such concepts attach themselves to God which this education has taught him to believe in and which he identifies with the qualities he had first attributed to the parents. Thus, it is reported, a child of 5 years and 4 months was told the Christian story of the creation of the universe. A few days later, as he was being washed one evening, he suddenly burst out with the remark: "How remarkable it is that the good God can create himself!" Another child of 5 years and 5 months is reported to have observed: "But God made man! so he must then have been born himself."

We now approach a further step in the religious development of the child. The conception of God undergoes a change, the transition starting about the age of 7 and completing itself about the age of 13, when childhood passes into adolescence. Wind, Sun and the other grand phenomena of nature are no longer explained by reference to God. God is no longer to be burdened with the day to day responsibility of accounting for their origin and causation. They now receive a purely natural explanation, sometimes spontaneous and sometimes influenced by adult instruction. Planets like the Sun and the Moon might be explained as coming naturally from the clouds or the stars or as the fire of volcanoes or mines behind the mountains. Clouds may be explained as made of smoke from the chimneys. The wind, likewise, may be supposed to be caused by the movement of clouds, waves or dust.

This change is representative of a larger and broader change in the character of the child's religion. In normal cases, there takes place at this stage a transition from a religion of pure externals to one of the inner

life, a transfer of emphasis from the outer to the personal satisfaction in religion. The religious consciousness of the child now frees itself from its direct and intimate relation with the outside world and wins for itself an ever-increasing measure of independence. There is a swing back in consciousness from the preponderance of receptivity to spontaneous creative development and inner working of the mind.

The child's behaviour in regard to worship and religious ceremonial also undergoes a change. The child no longer delights in emotional participation in and imitation of the worship and the religious observances of the adults. On the contrary, he now adopts an attitude of calm observation and thought about them.

By this time, however, the child is no longer a child. He has passed into the second major period of life, namely adolescence.

RAMJAS COLLEGE, DELHI.

PSYCHOLOGY IN WAR TIME

K. S. VAKIL

During the last war, British psychologists made studies of the various problems that arose, such as shell-shock in soldiers, raid-shock in civilians and children, motion-study and fatigue-study in industry, camouflage, night-vision, submarine detection, advertisement and propaganda, crime and rumour in war time, occupation therapy for the disabled after the war. In 1917, as soon as America joined the Allies, the first thing she did was to mobilise her psychologists. An elaborate scheme of mental testing for recruits was quickly put into force : and continuous investigations were made of such problems as civilian and military morale and of the influence of propaganda upon the enemy.

In the present war, every German army corps has its own psychological laboratory under the general direction of a central laboratory at the War Ministry in Berlin. In 1933, something like 140 psychologists were employed in the German army and during the succeeding years their number has been more than doubled. Their functions are : "To select the best men for the right place ; to train the ordinary soldier for the hazards, dangers, and strains of technical warfare ; to regulate relations between officers and men : to increase the efficiency of the military machine ; to sustain the high morale of the whole German nation ; and, in short, to solve, so far as possible, the countless problems of human behaviour raised by war." Mental tests are not applied to all army conscripts ; but special tests and other devices are used for selecting both officers and specialists (aviators, tank crews, wireless operators, detectors of submarines and of aircraft, drivers and mechanics of various types). Indeed, it is claimed that the rapid expansion of the *Luftwaffe* was made possible by the psychological selection of the most suitable human material. Much attention is paid to the adjustments of conscripts to military life—reducing home sickness, increasing understanding and good feeling between officers and men, and encouraging a greater spirit of initiative and independence.

In America, a special Emergency Committee was appointed immediately after its entry into war, including representatives from all the main psychological societies in the United States. The first problem they were asked to consider was the construction of an all-round test

to sift new recruits and trainees in a few broad categories, as each group reported at the reception-centres. A General classification test has been constructed, and has already been applied to upwards of a million men. It is employed for making the initial assignments, classifying men for special duties, balancing units, selecting officers, and the like. Further tests for the numerous types of highly specialised work which a mechanised army involves have also been developed. The main problems studied in aviation have been, first, the selection, classification, training and care of personnel; and, secondly, the psychological and physiological effects, temporary and cumulative, both of movement, of flying and of the strange environment in which flight is carried out. The chief method has been to put a psychological laboratory in miniature into the cockpit. More than 50 psychologists have themselves undergone instruction in flying in order to secure first-hand experience of the problems and requirements.

In Great Britain, psychologists have done much work in the study of the effects of evacuation on children and of air-raids on both old and young and of the methods of improving and speeding up the process of military training, and teaching a mechanised army how to use its mechanisms. Educational psychologists have also begun to consider some of the problems that are likely to arise after the war, *e.g.*, improvement of the methods of ascertaining the innate ability or 'intelligence' of children so that all able children, from whatever walk of life—not a few scholarship-winners only—may proceed to higher education at secondary schools and universities; the comparative advantages of day schools and boarding schools; the effect of this or that method of propaganda; and the attitude of this or that section of the community to various proposals—all demanding scientific investigation by technical methods at the hands of trained psychologists.

(Summary of Dr. Cyril Burt's article on the subject in "The Spectator" of August 21, 1942).

TRAINING COLLEGE, KOHLAPUR

Discussion

CLASS, VOCATION AND INTELLIGENCE

I

INTELLIGENCE IN ITS SOCIAL SETTING

N. N. SENGUPTA

It is widely believed that the different vocational groups within fairly homogeneous race or nation represent different grades of intelligence and ability. It is certainly true that they represent different profiles of ability. If the analysis reveals that intelligence varies correspondingly with the economic and social status of the vocation, the fact can be interpreted in terms both of heredity and environment.

It may be suggested that the nature of the home and its associated amenities influence the level of intelligence. It may also be held that vocational success and status are determined by intelligence. And the fact of a gradation in the levels of intelligence in the children of different vocational groups, is an indication of inheritance.

Haggarty and Nash have published a study of 8,122 children of the New York State. 6,688 of these were in the elementary schools and the rest in the High School. The following Table sums up the data :—

TABLE I

Parents' Occupation	Median I. Q. Grade 3-8.	Median I. Q. High School.	% I. Q. of 140 or more grade 3-8.	% I. Q. of 60-69 grade 3-8.
Professional	116	121	11.75	0.00
Business and Clerical Vocation	107	112	6.04	2.01
Skilled labour	98	111	1.91	3.69
Semi-skilled labour	95	108	1.15	1.19
Farmers	91	108	.87	6
Unskilled labour	89	106	.40	10.84

It will be observed that the median I. Q. diminishes gradually as we proceed from the professional classes to the stratum of unskilled labour.

Equally striking are the phenomena that the percentage of superior children diminishes and that of inferior children increases as the survey proceeds from the professional classes to the classes that supply unskilled and casual labour. The reason probably is not far to seek. Given equal opportunities, the persons who push up to the professions that ensure better social status and economic return, would have to succeed in a keen competition. They must, then, be supposed to possess some kind of ability that favours their success. And, when these persons marry, they usually select their mates from their own classes. It is not surprising, then, that children born of such parents will inherit certain traits that make for success, especially general intelligence.

The gradation of abilities, then, does not signify that the vocations in some way contribute to a higher level of intelligence in children. It means that persons with a certain intelligence-level choose a specific type of vocation and also mate among people who represent a certain high standard of ability and intelligence.

This conclusion is borne out by the study of 380 pre-school children carried out by Goodenough. She applied the tests twice: the second one, six weeks after the first. The age of the children varied from 18 to 54 months. The following Table gives the data² :—

TABLE II

Parents' Occupation	I. Q. 1st Test	I. Q. 2nd Test
Professional	116.1	125.0
Semi-professional	111.7	119.0
Clerical and skilled trades	107.7	113.1
Semi-skilled	105.3	108.0
Slightly skilled	104.3	107.1
Unskilled	96	95

Both of these sets of data confirm the view that children's intelligence-quotient diminishes as we descend from the upper to the lower ranges of the parents' vocational scale. The hypothesis of selective breeding when the selection is based on intelligence, seems to be confirmed by this study as also by the preceding one.

The suggestion that the environment of the home is an important factor in the determination of the plane of children's intelligence appears to be less reasonable on the basis of Goodenough's study. The smaller

children, those from 18 to 54 months have less time to be impressed by the stamp of the environment than the relatively higher age group. And yet, the maximum and the minimum I. Q. values in both the studies (Tables I and II) largely correspond. The other values exhibit a similarity of gradation though there is no actual correspondence. This latter may be accounted for by the fact that different age groups, consisting of different individuals, were studied in the two cases.

A parallel line of study explores the relation between the educational status of parents and the I. Q. of children. Witty and Lehman have given the number of 'gifted' and 'inferior' children corresponding to the various levels of academic achievements of the two parents. Gifted children possess I. Q. of 140 and over. Inferior children possess I. Q. of 70 and less. The following is a tabular presentation of the data :—

TABLE III

Educational status of Parents	No. of Gifted Children		No. of Inferior Children	
	Father	Mother	Father	Mother
High School	43	41	4	1
College	25	25	0	0
Business School	1	3	0	0
Elementary School	7	9	46	49
Av. years of School	13	12	1.5	4

Higher education at college and vocational training presupposes a higher degree of general intelligence. These may also implicate a greater degree of care given to the upbringing of children. But the latter hypothesis would not explain the remarkable absence of 'inferior' children. For, subnormality of intelligence, as revealed by tests, is not a trait that can be abolished by training.

A similar type of data is reported by Duff. Among other lines of work, he has attempted to find the relation of the level of intelligence with the vocational status of the family. The procedure was to select two groups of school students, one with I.Q. of 136 and up, and another with I.Q. of 100 ± 5 . The former is called "Intelligent" group and the latter the average or the "control" group. So far as possible, a member of the former was paired with a member of the latter from the same school. The following Table gives the number of children belonging to the two groups in relation to the vocational status of fathers :—

TABLE IV

Occupation of fathers	Intelligent Group I.Q. 136	Control or Average Group: I.Q. 100 \pm 5
Higher Industrial posts	6	0
Profession : mainly teaching	13	0
Lower Industrial posts, e.g., Commercial Traveller, etc.	27	12
Clerical	9	8
Skilled labour	9	8
Semi-skilled labour	30	50
Unskilled labour	6	23

The data show that the number of 'average' children increases relatively with the diminished status of vocations. It has been suggested in connection with Table III that the phenomenon in question may be accounted for by the greater opportunities available to children of the higher vocational classes. Duff's analysis, however, negates this idea.

"It can be seen" so runs the argument, "that the fathers of the intelligent groups are not as a whole very distinguished persons. Only those in the first two grades can possibly give their children any great advantages in the way of material environment over their neighbours; and even of these grades about half are school-masters, and not, therefore, men of great wealth. Material environment cannot account for the children's high intelligence. At the same time, there is a marked difference between the two groups, it is perhaps more easily seen by comparing the percentage in each group that reaches the level of skilled labour or higher (61% in the 'intelligent' group and 28% in the 'control' group)."

The facts so far recited suggest, thus, a heritable rather than an environmental factor. It is true that persons with a high I.Q.—value do not often succeed in vocations. It may be argued from this that children of parents successful in vocations, cannot be supposed to possess a high I.Q.-value as a heritable trait. But it must be recognised that I.Q. is not the *only* factor that makes for vocational success. There are a number of other factors. Let us describe these generally as *character* (C) which comprises a number of special abilities. We can then say that those who succeed in vocations or in academic life possess $I.Q. + C$, the value of the two symbols varying for different types of economic and social pursuits. It will be seen that a process of selective breeding may lead to the inheritance of intelligence if the latter be conceived as a heritable trait.

The conception of a gradation of intelligence parallel to the gradation of vocations, therefore, has a plausible basis in facts. The evidence, however, is mainly of a statistical nature and may not be applied to individual sets of facts. The verification of the hypothesis, therefore, is wanting in the assurance that arises from the perception of concrete instances. We are led to believe from such evidence that a class-wise gradation of I.Q.-values is a sound intellectual possibility. But practical conviction is often wanting.⁵

The objections to the acceptance of the kind of gradation suggested above arises largely from political and social bias. Man's vanity prompts him to believe that he can shape himself into a much higher type of personality if society and environment be favourable. The same feeling compels him to deny distinctions that place him lower in a social, economic or intellectual scale. His heritage on which he has no control, cannot condemn him to perpetual inferiority. The lower intelligence is an accident; it can be remedied by human effort.

Such sentiments stand in the way of a true appraisal of the facts, a recital of which has been given above. It is undoubtedly true that man's achievements can be much greater under better conditions of life. It is also true that environment, social and economic, plays strange tricks with one's career. But whenever we make a close observation of a personality, we are impressed by its strange limitations no less than by its gifts. These limitations, and often blindnesses, define the boundary within which the life shall move. The whole of this territory may not be explored. It is, however, a fact that man cannot go beyond it. Education and social opportunities may invest a person with a status but not with intelligence.

REFERENCES

- ¹ Holmes, *Eugenic Predicament*, p. 203.
- ² *Ibid.*, p. 204.
- ³ *Ibid.*, p. 205.
- ⁴ Duff, *Children of High Intelligence*, *Brit. J. Psych.*, 1928-29, pp. 419-38.
- ⁵ Maguinness, *Environment and Heredity* (Nelson), Ch. VIII.

II

PLACE OF INTELLIGENCE TESTING IN VOCATIONAL GUIDANCE

J. M. SEN

Vocational guidance involves an understanding of human capacities and acts. Thorndike in his "Mental and Social Measurements" has stated clearly the significant features of the conditions which confront us in the measurement of intelligence and achievement. Measurements which involve human capacities and acts are subject to special difficulties due chiefly to the following:--

- (i) The absence or imperfection of units in which to measure.
- (ii) The lack of constancy in the facts to be measured.
- (iii) The extreme complexity of the measurements to be made.

From a consideration of the nature of these special difficulties, he has further stated the essentials of a valid scale for the measurement of mental and social facts. These essentials are treated under the heads, objectivity, definiteness, comparability and reference to a defined zero-point in terms of a defined unit. "What science means by a perfectly objective scale is a scale in respect to whose meaning all competent thinkers agree." No system of grading is either absolutely objective or absolutely subjective. What we mean by an objective mental scale is merely a scale which is less subjective, and about whose meaning there is less disagreement among competent thinkers, than the ordinary scales of mental and social measurements which have been in use. Moreover in regard to vocational guidance the reliability of an intelligence test must mean *self-correlation*. That is to say, if a test measuring the same object two or more times disagrees with its own findings each time, it cannot be relied upon; either it measures something different each time, or it measures varying fragments of the same thing: either horn of this dilemma is an intolerable situation.

The zero-point most commonly used in measurements of relationship between scores in different tests and examinations is the Mean of each distribution of such scores. The unit used for locating positions above or below this zero-point is a measure of the variability of the distributions. The essential quality of a good point of origin and of a good unit measure

is stability. Judged by the above criteria the most helpful intelligence tests are (i) those devised by Terman and Merrill for measurement of abstract intelligence and (ii) the Performance Tests for measurement of concrete intelligence.

The tests for *temperament and character* would have been helpful in giving vocational guidance. But generally the zero-point and the unit of measure in regard to tests of temperament and character are variable if not elusive. All the same if vocations are classified according to the degree of intelligence required the tests of temperament and character can help in regard to proper placement of an individual in a vocation. But the real complexity of the problem arises on account of the variability of mental functions in the same individual from day to day and hour to hour. The variability of mental functions must be recognised in the construction, administration and interpretation of all tests and results. Certainly we should not attempt to estimate an individual's ability to read, to solve algebraic problems, to demonstrate geometric propositions, to spell, etc., on the basis of his reading of one sentence, his solution of one problem in factoring, his demonstration of the parallelism of chords perpendicular to the same diameter or his spelling of one or two words. Only by taking a large sampling of an individual's performance can we arrive at a reliable estimate of his normal or average ability of the kind tested.

In any guidance or selection programme, the necessity of taking into account those characteristics of an individual which go to make up that mythical entity variously termed his personality, character or temperament, cannot be overestimated. In the adjustment of the individual to his world and the response of the world to the individual they play an important part. Any attempt at a study of the individual and the programme for his guidance must, then, recognise their importance, for characteristics that are assets in one situation are liabilities in another. This process, however, of getting an adequate picture of this phase of an individual is extremely difficult. The common method of securing an opinion in these matters from persons with whom he is associated is not always reliable. A nervous, high-strung teacher calls a student "troublesome," while he is labelled "high-spirited" by a more placid colleague. Recognition of the fallibility of unchecked judgments, as well as the necessity of finding some satisfactory method of securing a reliable measure of this aspect of the individual has led to the development of personality-rating scales in America. The Committee on Vocational Guidance and Child Labour of the White-House Conference on Child Health and Protection stated that "pending the development of objective measurements of personality traits, rating-scales will be necessary for some time to come. It further stated that in using

rating-scales an effort should be made to safeguard and improve rating procedures by adhering to the following important principles:

(i) Only those traits for which valid objective measurements are not now available should be rated.

(ii) Traits should be mutually exclusive.

(iii) No single trait should include unrelated modes of behaviour.

All the same objective tests of personality characteristics are a definite need in the field of vocational guidance.

KRISHNAGORE COLLEGE, KRISHNAGORE.

III

AVENUES OF EMPLOYMENT—A NECESSARY ITEM IN THE VOCATIONAL GUIDANCE PROGRAMME

PARS RAM

The primary aim of vocational guidance is to give information and advice to people as to the occupations in which by reasons of their mental abilities, physical fitness and training they are most likely to do good work and to provide fully for their own needs. In order to achieve this vocational guidance agencies have usually emphasised the securing of the following kinds of data :—

(i) A complete and detailed account of the physical, intellectual and moral development of the individual.

(ii) Aptitudes, temperaments and intellectual qualities needed for various occupations together with the occupational diseases, accidents, and moral and material advantages of various occupations.

On the basis of the information secured under (i) and (ii), the vocational guidance officer is able to advise his client to avoid certain professions and to take to certain other professions. Now suppose the definite profession that has been recommended is already overcrowded or if it is controlled by members of a caste or community who would not allow members of other castes or communities to enter the profession. Instances of this kind are not wanting in India.

In these cases vocational advice given and the labour spent on it is all wasted and very often a young man, finding that he is prevented from entering into the occupation for which he is most fitted by the party controlling the employment market, becomes embittered against society in general. These considerations suggest that a vocational guidance worker must know much more than mere mental testing and occupational analysis. He must study the fluctuation in the employment-market, the future of the various occupations, the possibilities of further development and differentiation within the same profession. Besides these he should be able to explore the possibilities of recommending a profession hitherto not tried by the community in which the vocational guidance work is being done. Hence vocational guidance is no more an individual-centred movement. No doubt, it is primarily concerned with the individual's interest, but it subtly merges into the larger whole of the economic and social life.

The problem of vocational guidance is twofold. The individual with all his mental and physical assets and liabilities must be provided with work suited to his talents: and secondly, the vocational guidance agency must keep abreast of the general development in the labour market and of the changes taking place in the work in different occupations and in the general economic conditions of the nation and thereby supply suitable labour for the growing economic needs of the country.

The various factors which determine fluctuation in employment in various occupations have to be carefully studied. War, rates of tariff on various commodities imported from different countries, rationalisation and planning of industries in other countries, exchange rate and gold standard—all these factors have a direct effect on the fluctuation in labour market in a particular country. A Vocational Guidance Agency has to make a careful note of (1) the new industries thrown open by these factors and (2) the well-established industries which are likely to be disintegrated by these factors. Again the type of training of labour for new industries and the finding of work for the displaced labour are some of the problems which are required to be carefully studied by vocational guidance experts. Whenever these conditions operate the vocational guidance agencies have to find suitable persons who will work the new industries successfully.

Secondly, social factors orient young people towards certain professions and produce a negative attitude towards others. There is a marked tendency on the part of young men to enter into professions requiring University degree or highly specialized kinds of training. The basic cause of this tendency lies in the fact that a University graduate has a better social status than the one who is not a graduate. In recent years many attempts have been made by Provincial Governments to interest educated young men in the profession of agriculture. The results have been discouraging because of the social factor conditioning these young men against agriculture. It has been found that financially some of the so-called humble professions are more satisfactory than the liberal professions. Yet in spite of this, there is a greater rush in the liberal professions than in other professions. This fact again shows how powerful is the social factor in producing certain definite tendencies towards employment in certain professions.

Thirdly, changes in the consumers' taste, new discoveries, changes in the type of power used for work such as steam, electricity, oil, etc., and changes in the availability of raw material, development in machinery—all these factors do have their effect on the labour market.

The duty of the Vocational Guidance workers in the face of these fluctuations in the employment market is clear. These officers must gather

together all the information available about the possible new occupations. This information should consist of (i) the type of aptitude, etc., required for each profession, (ii) opportunities for further development within the professions, (iii) opportunities of apprenticeship, (iv) risks and benefits accruing from the profession.

This information should be published in the form of leaflets and monographs. At the same time this information should be taken to all the parties concerned such as parents, children, capitalists and employers so that people's attention and thinking is directed to these problems. All these occupations should be made known widely so that people are kept thinking about them. Since fluctuations in the labour market take place rapidly, it will be necessary to revise and rewrite these monographs from time to time.

There is immense scope for new avenues of employment for young Indians in the manufacture of goods at present imported from elsewhere and for which a taste and a market have already been created in the country. The process of democratization has created in the average person a craving for better living as well as a tendency towards the consumption of more material goods. This fact has given momentum for the production of all kinds of articles of human use and thereby has created opportunities for employment for a large number of people.

In spite of the extended opportunities for new vocations it is very difficult to persuade the average young man to adopt a new career. Not all of them are capable of giving the new profession a trial. The author of this paper found that there is more variability in the choice of a career amongst non-agriculturists than amongst agriculturists. Again, of the non-agriculturists, the trading castes are more spread out in their professions than the non-trading castes. Peasants take to a new profession only under conditions of extreme adversity, such as the failure of crops, etc. The most common of the professions they take to is their enlisting themselves as soldiers. The peasants who fought in the last war have shown a remarkable capacity for taking to a new career. Again, it is a common observation that people who have gone in for a new career belong to the area with a very high density of population. Once a man has established himself in a vocation, many others in his neighbourhood successfully imitate him and take to the new career. Again, some amount of frustration and 'wanderlust' and little annoyances with one's surroundings supply the necessary incentive to an individual for his taking to a new profession. Every adventurer in a new career is a little Clive unwanted at home who is kicked into a foreign country to struggle to make his fortune. To what extent can propaganda and rational appeal orient people to new careers is a question

on which scientific judgment is at present available. Mere propaganda and rational conviction that a particular career is good in itself cannot supply the necessary incentive for the adoption of a new career. How can propaganda build up a favourable attitude for certain careers is a problem on which research work is needed.

Besides the psychological difficulties that obstruct the way of a young man to new career there are certain external difficulties. These are :—

(i) *The difficulties of finding suitable implements* for various trades and particularly for new trades. Take any manufacturing concern. It requires implements for the various operations employed in the process of manufacture as well as in testing the efficiency and capacity of the manufactured article. Each operation requires special tools. Again, every trade requires standardized tools for which there is no reliable manufacturing concern in India at present. Incentive for inventing machines comes from an economic and industrial planning. The ruling power of the land anxious to make India a market for manufactured goods from other countries has been quite indifferent to industrial development. The inventive genius of the country therefore has not been properly awakened. Yet one finds thousands of Indian inventors who are compelled to sell their inventions and services to the concerns controlled by foreign capital.

(ii) Those who have a technical training get no encouragement to start their own workshop either from the Government or from the capitalists. There are a large number of capable Indian technicians who are wasting their talents on a routine job in a Government service after making futile attempts to start an independent career. That is partly due to the fact that they did not get the same facilities of raw material, etc., as did a foreign concern. Capitalists are fully alive to the fact that any attempt on their part to come in competition with a British concern will create difficulties for them and hence they are shy of financing projects of Indian technicians.

(iii) Persons intending to start small scale industries do not have cheap power such as electricity, oil or steam at their disposal to work a small plant. It is very expensive to start a power for plant in addition to the other mechanical equipments.

(iv) Lastly, the educational system of this country does not create in the educated a sufficient interest in manual work.

The above-mentioned difficulties can be met by the following methods :—

Propaganda in favour of new careers should be directed to educate the capitalists as well. In order to be effective it should not be conducted on the mere ideological plane but should be carried out in details.

Besides this the Government should come forward with financial aid for the young technicians wanting to start a new profession.

Thirdly, a research organization for devising new tools for various trades is an immediate necessity and should be taken in hand.

Lastly, there should be some method of creating a love for the manual work amongst the students at the school.

Not all avenues of careers can be rationally determined and predicted. The fluctuations of the labour market can be foretold in a comparatively very few trades. This prediction is largely determined by the character of the rational production and the stage of industrial development. Nor can the distribution of labour in any profession be predicted for a long time. Fortunately, most people are capable of doing a large number of different kinds of work and therefore can adjust themselves easily to the rapidly changing conditions. In India there is no industrial or economic planning at present. In an unorganized mass society like ours the task of finding new careers will be largely left to individual initiative and enterprise.

F. C. COLLEGE, LAHORE.

IV

THE AGE FOR VOCATIONAL GUIDANCE

S. JALOTA

The literature upon vocational guidance is fairly rich by now. It is increasingly dealing with different vocations, e.g., industrial, mechanical, clerical and handicrafts. There is one problem which to my knowledge has not been considered with the care it deserves. I propose to discuss the problem as to the age when the vocational guidance would prove most useful to the individual as well as the community.

When Prof. Myers and his colleagues started work in England, they had a practical problem in view : boys had to be sorted out as those likely to gain by higher University education and those better fitted to employ their brawn rather than their brains. So to them the age for vocational guidance was the school leaving age. A little later they took on the role of mental guidance clinics to junior boys who appeared to be misfits in the normal school classes. At about the same time they began to study the various vocations, and suggested changes for the misfits of all adult ages. So they did not adequately pause to consider the age when this vocational guidance is useful.

If we look to the various vocations, their diversity is matched only with the variations in the ages of the persons, who are interested, are learning or are efficient in their vocations. Take a simple case of tailoring : Persons of all ages from 8 to 50 may be found who are just learning or quite efficient in their work. Then the problem arises, shall we devise vocational tests for the age of 8 or 50. Again, although the University courses for engineering prescribe a minimum adult age, the popularity of Meccano sets points to the possibility of learning the rudiments of practical mechanics at a much earlier age. This example also gives rise to another problem. Will the interest and ability of a child for a certain vocation remain uniform through all the stages of its growth and development? From the classical investigations of Stanley Hall, it is clear that the interests of children do change from age to age. Thus the practical utility of any vocational guidance is bound to be limited by the variations of the psychophysical conditions of the individual as well as socio-economic character of his situation. From one point of view, a fair anticipation of stability in the organisation of psychophysical propensities would be best suited to our attempts at vocational guidance. This period is to be found either in

the so-called latency period of late-childhood, or in the post-adolescent period of maturity. Any vocational tests given during late-childhood should be followed up and corroborated by further testing during maturity. It would be very bold however to imagine that the organisation of the psychophysical propensities during maturity would follow a pattern parallel to the one found during late-childhood. Again, it would not be unusual for the socio-economic conditions to materially alter an individual's situation as he passes from late-childhood to maturity. Familial circumstances are bound to change in all probability, and they may bring about a corresponding alteration in the interests and ambitions of any given individual. The advice to become a draughtsman for a boy may easily be altered to one for mastering the arts of painting or modelling to a man with similar abilities but plenty of cash and leisure ; and *vice versa*.

Another point for our consideration is the finding of the psychoanalysts that the Oedipus complex may pass through positive and negative phases before attaining stability through reconciliation. The attitude towards the parental profession is largely determined by the developmental stage of the Oedipus complex in the individual. Since the reconciliation of the Oedipus conflict appears at a much later stage in maturity once again we are forced to the conclusion that vocational guidance offered at the earlier stage is bound to be of a more or less temporary character.

There are only two possible factors that can help us in this theoretical muddle: (i) It may be that the inertia of the average human nature, reinforced with the force of habit, may prove strong enough to fairly withstand the developing variations in the psychophysical propensities during adolescence, or (ii) we may utilise a majority of tests that are largely free from the age factor.

As far as the first point is concerned, I do believe that the average adolescent psychophysical variation may be fairly kept within bounds, except when the familial circumstances, specially the socio-economic factors, show extraordinarily excessive variations. As far as the second point is concerned, I think it is not difficult to devise tests where a majority of items should be free from the age factor ; especially as the maturation of of the sensorium takes places at a fairly early age ; and the test will have more to do with sensori-muscular adjustments rather than muscular strength. The latter of course cannot be accurately appreciated in the pre-adolescent period, but is largely a consequent of the physical exercises carried out by the given individual.

So I believe that the tests for vocational guidance should be primarily given during the early stages of the latency period. This advice should be revised during the late adolescent stage, and a final revision might be

undertaken during maturity. So I suggest the following ages for vocational guidance :—

Primary guidance during	...	6—8
Tentative guidance during	...	16—18
Final advice during	...	25—30

DOABA COLLEGE, JULLUNDUR.

RESEARCH NOTES

SOME CASES OF VOCATIONAL GUIDANCE

Since 1938 I have been interested in investigating the reasons which prompt one to seek vocational counselling. I believe that help given to a person can be most effective only when the person concerned knows on what exactly he needs help. In Vocational Guidance, some cases spring up now and then where a very strong motive is displayed for overthrowing the guidance given and to discredit the technique on which such guidance is based. Whatever advice is given in these cases, a failure is bound to be recorded as the result of following the counsel. It is interesting to note, however, that in these cases before coming for V. G. neither the candidate nor his guardian feels comfortable in the choice made by the other and that a satisfactory adjustment becomes possible only when the futility of the official guidance has been demonstrated. It is necessary, therefore, to understand in every case the reason for one's coming to seek vocational advice. One of the aims of V. G. is to present the counsel in such a way that the candidate becomes convinced about the rightness of it and there generates a desire in him to follow it earnestly. V. G. Bureaus, like the National Institute of Industrial Psychology, London, look upon the task of communicating the arrived-at counsel as a serious psychological problem and train the workers in such a way that they may acquire skill and efficiency in the execution of that task.

In the following table, eleven of those cases who came of their own accord for V. G. are recorded with some details. The causes which the candidates thought to be *causa prima* bringing them to our department for guidance are noted in one of the columns of the table. The causes as offered by the candidates cannot be taken as the real ones for certain obvious reasons. Nine of these cases were advised to seek psychological help for improving their mental states and abilities. Out of eight male cases one is unemployed. He left his studies four years ago but in spite of his family's influence and resources could not choose any career and prepare himself for it. Other seven cases are in employment or are in preparation for one but they were not very comfortable and happy in their present placements. Three of these seven are married but one was living in separation. Excepting the two students there was no bar to anyone's marriage. Every one showed signs of suffering from lack of healthy

Candidate	Age	Economic Situation	Employed or not	Educational Achievement	Intelligence Quotient	Personality (15)	Stanquist Score (100)	Temperamental Observation	Causes offered by Candidates	Findings from Interview
M	27/6	Good	Yes good	Matric	128	36	86	Border-line	Suitability in desired profession	Challenge to father, to be restrained.
F	22	Excellent	No	M.A. st.	131	32	59	Border-line	Curiosity for testing, idea of intelligence	Expectation of help, rescue
M	25	Better	No	B.Sc.	132	29	51	Introvert	Suitability-vocational	Lack of adjustment
M	31/7	Good	Yes fair	Sanskrit	123	17	23	Border-line	Curiosity for testing	Dissatisfaction anxiety, inhibition
M	28	Excellent	Yes good	I.A.	107	19	36	Extrovert	Co-operation with V. G. as done by the dept.	Exhibitionism, appreciation
M	24	Excellent	Yes good	I.Sc. and Tech. Train.	130	34	74	Extrovert	Curiosity, personal knowledge	Reparation phantasies
M	33	Better	Yes good	M.A. and Tech. Train.	131	26	35	Extrovert	Vocational suitability	Inability to enjoy, sexual inhibition
M	34/2	Better	Yes good	M.Sc. and Tech. Train.	131	20	17	Extrovert	Vocational difficulty	Sexual inability
M	21/5	Doubtful	No	B.Sc. st.	137	39	64	Border-line	Vocational suitability	Nervousness
F	19/0	Excellent	No	B.A. st.	118	30	59	Introvert	Curiosity for mental testing	Sexual difficulty, inhibition
F	17/0	Excellent	No	B.Sc. st.	117	29	53	Extrovert	Comparison with sister	Sexual curiosity, apprehension to injury

instinctual gratifications. Sexual life in all of the cases is far from satisfactory and is full of problems and difficulties some of which are manifest and some not.

In two cases, exuberance of satisfaction for their vocational success was well expressed but their start in vocation was a shaky one. In others, the chosen and followed-up occupations were good from various outside points of view, yet a dissatisfaction and 'dragging on' feeling could be detected. In all cases best vocational possibilities have somehow been missed.

Relationship with parents in many cases needed investigation. In one female case recorded, a very affectionate relationship with rather young father (age-difference 20 years) was a very important factor determining pursuit. In a male case, the competition with father and the urge to excel him in all respects in the vocational field were strong motives in professional activities. In another male case, the burden and the responsibility of challenging the father not only in the choice of his career—he chose the same profession as his father—but also in preparing for it and lastly in pushing it for success was too much for the candidate to bear. He had excelled his father but could not any longer feel comfortable in continuing this excelling business and began to experience nervousness and register inefficiency.

Life of such careerists as Samuel Butler would enlighten us very much on problems of career choice and later follow-up. Butler chose those professions in which he could rise as a rebel and when he attained an unparalleled position in the profession he lost all charms for it and turned on to something else which enabled him to repeat the mechanism. His chief interest lay in that mechanism. These exceptional careers offer us scores of knowledge. In them it is observed that certain motives are carried to great heights. These motives are not so well displayed in the ordinary cases but play nevertheless very important roles in determining the career first and then the success in it. It is my humble submission that unless the vocational psychologist is able to detect these underlying reasons for the candidate's coming to him, he will not be able to satisfy the client nor can he effectively influence him in the matter of career-choice. I am therefore, keen in deepening our knowledge of the workings of those motives and improving our technique of detection. In this note I have enumerated some of my findings. I shall welcome similar investigations and shall be very much interested in the findings thereof.

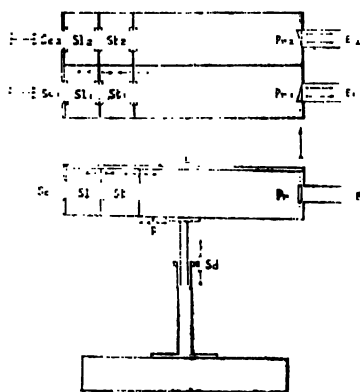
APPLIED SECTION,
PSYCHOLOGY DEPARTMENT,
UNIVERSITY OF CALCUTTA.

RABI GHOSH.

Apparatus—RIVALRY BOX (New Type)

The Model whose diagram is given below was devised to provide scope for changes in the saturation as also in the brightness values of the component colours in rivalry experiments. It may be noted here that the settings introduced in this model are not provided for in the types of apparatus generally used in the laboratory.

Two differently coloured stimuli are allowed to fall on the two eyes of the subject simultaneously from separate compartments. The chroma and illumination of the stimulus-colours can be gradually varied by the additions of coloured and ground glass slides. Different stimulus patterns made of metal slides, namely, circles, squares, etc., may be selected for experimentation and placed just at the centre of the separate compartments; hence there is the possibility of demonstrating the influence, if any, of different patterns on the rivalry effect.



The apparatus may be used with or without prisms. With the help of the prisms and a slight adjustment of stimulus-distance a single objective may be formed if necessary. An adjustable chin-rest and a piece of black cloth as head-cover are necessary for conducting experiments.

The advantage of this new apparatus is the easy demonstration of rivalry phenomenon with the possibility of estimating the influence of chroma and brightness as also of stimulus patterns on rivalry.

M. GANGULY

PSYCHOLOGY DEPARTMENT,
CALCUTTA UNIVERSITY.

ABSTRACTS and REVIEWS

Concept of Normal Mind—E. Jones. *International Journal of Psychoanalysis*, Vol XXIII, 1942, Part I.

Character analysis is playing a larger part in psychoanalytical work at the present time (investigations of Glover, Klein and others) than before. It is time therefore that the vague definitions of normality which so long passed current among the therapists and proved quite adequate in their practice for gross work be more carefully scrutinised.

Trotter drew attention to the assumption that the writers of the psychoanalytical school make when they accept the statistically 'normal' mind as the 'healthy' mind. The assumption is that the current social standards of whose influence the 'normal' mind is a product are healthy too, i.e., are qualified to call forth the best in the developing mind they mould. That is an assumption which is debatable. Indeed Freud himself time and again betrayed his attitude of penetrating scepticism on the subject of prevailing social standards.

Casual definitions of normality fall into two main groups: (1) those developing on the criterion of happiness and (2) those depending on that of adaptation to reality. By reality is here meant psychological reality and this in its turn may be reduced to mental contact with the individuals confusing the particular environment of the subject. Such contact does not necessarily imply acceptance of the environmental standards but does imply a sensitive perception of them and a recognition of their social significance when deciding on a course of conduct. The criterion of happiness is difficult to use empirically because a subjective judgment inevitably comes into play in deciding whether a man is happier or less happy than he ought to be in the given circumstances. The concept of efficiency stands midway between the two. One is not necessarily efficient if he is excessively influenced by other people or is quite insensitive to their feelings. Efficiency is incompatible with a state of mind destitute of all gusto where no achievement seems such worth while, while using this concept as a criterion of normality it is important to distinguish between merely external success in life where opportunity plays such a large part, and internal success, i.e., the fullest use of the individual's powers and talents. Three attributes are thus abstracted from the customary definitions of normality, *viz.*, relation to one's fellows, efficiency in mental functioning and happiness. These are now considered one by one. Abraham cautiously stated that the most complete development presupposes a sufficient quality

of affectionate and friendly feeling and he correlated this with the degree to which narcissism and ambivalence have been transcended in the course of development.

We do not possess any method of quantitatively measuring degrees of friendliness and affection or of estimating the amount that one would expect to find in a 'normal' personality, or the proportion between it and other components. Nevertheless some qualitative statement may be made.

Let us remember that the greater part of what used to be called narcissism is of a secondary nature and is a matter of regression brought about as a flight from the difficulties in the Oedipus situation which the child has not been able to surmount. Similarly the retaining of the ambivalent attitude is also a regressive flight with the primitive instinct of hate which is used as a defence against the difficulties in question.

It is to be observed that certain forms of excessive friendliness and conciliationness and a good deal of philanthropic benevolence are really exploitations of the love instinct the function and meaning of which is the repression by 'reaction formation' of unresolved sadism. This should preclude us from estimating the amount of friendliness in a given personality merely by observing what is apparent. On the other hand it is equally certain that much of what passes as 'strength of character' is an illusion. Obstinacy, pugnacity, hardness of heart, etc., are often little more than defences against love, of which the person is too afraid, or more strictly, of possible consequences of this love.

The degree of friendliness and affection therefore to be estimated by the internal freedom of such feelings rather than the quantity of those that may be manifest. The state of confident serenity brought about by assimilation and control of the unconscious sadism and thus allowing love and friendliness to flow easily is poles apart from the neurotic conciliationness of the type described above. Though the two are liable to be confounded on superficial observation slight reference must be made here to what is perhaps the most important social aspect of these few remarks, *viz.*, the assessing of the 'normal' of the relations between the interests of the individual and those of society. Psychoanalysis has established that neurotic tendencies can lead to extreme attitudes in either direction. That is not to say that every extreme attitude is neurotic. Probably the criteria will be somewhat difficult in the two sexes, it being possible that with a normal man loyalty attaches to a larger group than with a normal woman. As regards the attitude of mental efficiency only one consideration is put forth here. It is assumed for good reasons that all the energy employed in the pursuit of any activity is ultimately derived from primitive unconscious sources, and it is therefore plain

that the optimum consideration for the 'efficient' expenditure of this energy must be an unimpeded flow of it. Any state of affairs in which this flow is constantly hampered to some extent or is exposed to temporary interruption will be one where efficiency is temporarily or permanently below its potential maximum.

Finally we have to consider the attitude of happiness. By happiness we do not here mean simple pleasure but a combination of enjoyment or rather the capacity of enjoyment, with self-content. Two conclusions are forced on us by psychoanalysis. First, that impairment of happiness is always due to the triad of fear, hate and guilt, and secondly, that the difficulties in development responsible for the inhibiting effect of this triad are in essence those of the Oedipus situation. Summarily it may be said that fear is the most fundamental member of the triad. The view that anxiety is the Alpha and Omega of psychiatry may be unhesitatingly extended to the field of normal psychology and it may be maintained that on the way in which any individual deals with the primordial anxiety in infancy more depends than on anything else in development. In measuring the freedom from anxiety one cannot be content with merely observing the manifest freedom, but must also take into account the cost at which this apparent freedom is maintained, *i.e.*, the presence or absence of secondary defences. Many unsocial attitudes, *e.g.*, selfishness, antagonism, etc., are really defences against something within which the individual has found intolerable, and so has been unable to master. Unconscious guilt is so evidently the foe to freedom that patients often raise the question whether conscience in any form is not to be regarded as a morbid entity. We surmise that the psychological problem of normality must ultimately reside in the capacity to endure—in the ability to hold wishes in suspension without either renouncing them or reacting to them in defensive ways. Freedom and self-control are thus seen to be the same thing.

We reach the conclusion that the nearest attainable criterion of normality is fearlessness. The most normal person is 'angstfrei' but we must be clear that we mean by this not merely manifest courage but the absence of all the deep reactions that mark unconscious apprehensiveness. By adopting the criterion of unimpeded development we have advanced some distance towards establishing an objective standard of normality and have thus practically answered the question: what is a normal mind? Though much remains to be learned, still we have shown that the problem is not an insoluble one. As to the question whether a normal mind actually exists, the answer is definitely in the negative. We have no experience of a completely normal mind. Further, as absolute perfection is nowhere met with in the universe even in Newton's Laws of Motion, it would be astonish-

ing to find a mind ideally normal in the absolute sense. I do not know whether normality in the mere limited sense can be expected in the future when early mental development is better understood and seriously cared for.

S. C. MITRA.

A Two-Dimensional Rating Scale—Cliford E. Jurgensen. *The American Journal of Psychology*, Vol. LV, No. 2, 1942.

There are two types of rating scales, (1) those in which the frequency of a given behaviour is rated and (2) those in which the type of behaviour is checked. It is found however that such scales fail to give an adequate picture of an individual, because a valid behaviour rating scale should indicate the extremes of behaviour that an individual shows and also the frequency of various types of behaviour. A two-dimensional scale was therefore developed in the following way.

The first scale constructed was in a graphic form. Twenty-eight pairs of adjectives, descriptive of behaviour but opposite in meaning, were listed in the blank. Presence or absence of behaviour described by each pair of terms was indicated by a check made between the two antonyms. The scale was found inadequate and unreliable because interpretation from the check mark was made differently by different raters as also by the same rater at different times. This difficulty was remedied by using descriptive adjectives, equally spaced, physically and psychologically, on the line between the two extreme terms. It was a highly reliable rating but like other graphic scales, it also could not indicate whether an individual was seriously maladjusted or not.

The scale was then modified so that every question (trait) was analysed into five types of behaviour and each of the latter was rated on a frequency scale. The behaviour-types were the descriptive adjectives used in the previous graphic form of scale. The first and fifth terms were indicative of the extremes of a trait whereas the middle or third term represented the 'normal' or 'average' behaviour. The five terms were so selected that differences between them were approximately equal. A seven-point scale was adopted for assessing each of the behaviour-types. The terms of the seven points selected on the basis of being approximately psychologically equal were (with their abbreviations) as follows: Constantly (C)—Almost always (A)—Usually (U)—Frequently (F)—Sometimes (S)—Hardly ever (H)—and Never (N). The frequency of five types of behaviour under each trait was checked by encircling one of the seven abbreviations. As it was deemed necessary the scale was modified by substituting longer descriptive phrases in the place of brief phrase of adjectives. The rating scale origin-

ally contained 20 questions but subsequently on grounds of suitability it was reduced to 10.

The present technique appears valuable for purposes such as personality questionnaires, adjustment inventories, etc., as well as for rating scales. A sample of the two-dimensional rating scale is given below :

1, What is his mood?

C A U F S H N Hilarious, hysterical

C A U F S H N Cheerful, animated, radiates happiness

C A U F S H N Good humoured, attracts little attention by his mood

C A U F S H G Dispirited, tends to see the dark side

C A U F S H N Dejected and morbid

and there are nine other such questions.

It was desired to attach a numerical score to each rating and an empirical scoring system was therefore devised. For every one of the 10 questions appearing in the scale there were five types of behaviour-reactions. The middle type was supposedly descriptive of adjustment and so no weight was attached to this behaviour because large scores were to be indicative of maladjustment. The second and fourth types were each given a weight of 2, and the first and the fifth representing the extremes, each a weight of 2; weights were also assigned along the dimension of frequency as follows: if the behaviour 'never' occurred the weight was 0, if 'hardly ever' it was 1, if 'sometimes' it was 2 and so on, so that if the behaviour 'constantly' occurred the weight was 6. The complete weight of any behaviour-reaction was obtained by multiplying the weight of the frequency by the weight of the type of behaviour.

S. N. RAY.

Studies in the Values and Relations of D. L. under Different Attitudes.—By Gopeshwar Pal, D.Sc., Lecturer in Psychology. Published by the University of Calcutta. 1942.

The booklet under review formed the doctorate thesis of the author who conducted the investigations recorded therein for more than six years. The work stands as a marvel of patience and care. The experiments and the results are not at all of an exciting order and it must have been only the scientific spirit of enquiry that made the author stick so persistently to his problems.

The perceptual effects of a slow but continuous change of intensity of the stimulus have long been the subject-matter of investigation by different psychologists. It has been asserted that a frog placed in a beaker of water may be boiled to death without any manifestation of suffering on the

animal's part provided the temperature of the water be raised very gradually. It seems as if the slow and continuous increase in the intensity of the stimulus does not afford any starting point for a danger signal for the organism to arise. Is this statement true for man also? What is the rate of increase of intensity of a stimulus that would be appreciated by the subject and at what point on the scale does the appreciation come? Do different rates of change produce different results? Is the continuous increase better appreciated when the subject's attention is directed to the stimulus than when it is directed to the sensation produced by the stimulus? Again a very interesting consideration arises out of work of this type. When as in Weber's experiments the increase in stimulus is arranged to act in a discontinuous and discrete manner we find that a certain law known as the Weber-Fechner Law is in operation when the stimulus intensities are for medium value. Is there any similar law in the case of continuous increase of which the Weber-Fechner Law would prove to be a special case? These are some of the problems that Dr. Pal has attempted to solve.

Dr. Pal's work is confined to the sphere of kinaesthetic sensations mainly and is the most thorough of its kind. His subjects made their observations under different attitudes. The maintenance of a particular attitude for any length of time by any subject is an extremely difficult task. Dr. Pal has observed that his subjects were able to adopt and maintain any prescribed attitude for the requisite length of time. Dr. Pal's subjects deserve to be congratulated on this point. The maintenance of a desired psychological attitude to order is essentially a question of temperament and it has been my experience that Indian subjects can adopt and maintain what Dr. Pal calls the process attitude more easily and more successfully than Western people.

The author has proved that in human subjects also as in the experimental frog certain slow rates of increase of the stimulus are not appreciated even though the total increase be considerable. This is of course true within limits. The rate of increase that has been regarded by Dr. Pal as just perceptible differs with different initial values of the stimulus and with a given initial stimulus the D. L. values vary with the rates of increase showing a maximum figure when the rate is medium. Satisfactory explanations have been given for the phenomenon and its mathematical implications have also been worked out. Dr. Pal believes that his equation $y = a + bx$ where y represents the D. L. value, x the initial stimulus and a and b are constants comprises the Weber equation $y = bx$. This is an extremely important finding. Dr. Pal is of opinion that although the D. L. values in his experiments did not show material difference under different attitudes

the maintenance of one particular attitude throughout the experiment was desirable. Dr. Pal's work deserves to be seriously considered by all psychologists. I only wish that Dr. Pal would now extend his investigations to other sense modalities to justify his generalizations.

G. BOSE.

The Nineteen Forty Mental Measurements Year Book—Edited by Oskar Krisen Buros. Published by Mental Measurement Year Book, Highland, New Jersey. Pp xxi, 674.

The volume is the fifth publication of the series of Year Books that Prof. Buros started in 1934 with financial help from the Rutgers University and in collaboration with contributing reviewers from different parts of the world. The Year Book is a collection of descriptive and critical reviews, properly classified and indexed, on different types of tests and on theoretical publications on tests. Within a decade after the last world war, the market became flooded with tests and since then there has been considerable additions to the previous lists every year. Many tests in the market are certainly of doubtful value, either because they were constructed too hastily and carelessly, or because they have not been fully and properly standardised. Test users stand, therefore, in need of some expert guidance in the matter of selection of tests that may prove to be suitable and good for their particular viewpoints. The Mental Measurement Year Book was started to meet this need as a 'co-operative non-profit service for Test users.'

The great zeal, the conscientious care, and the thoroughness with which Prof. Buros and his associates have worked for the success of the Year Book project is evident from the fact that each successive volume has been a distinct improvement on the preceding one. The present volume has several features which make it vastly more valuable than the preceding publications of the series. We can refer only to some of these here. The practical value of the reviews would rest mainly on two things: (1) on their representing the actual interests and viewpoints of possible test users, and (2) on their being honestly and authoritatively critical. The most outstanding feature of the present Year Book is the systematic attempt made in these two directions. In selecting reviewers for a particular test care has been taken not only to base selection on the basis of proved or widely testified ability and on freedom from bias but also to take into consideration the most important purposes for which the test in question is likely to be used. Some of the tests have also been reviewed by more than one reviewer and we are glad to note that in future this procedure of multiple review of a test will be more extensively applied.

A few other special features of the present Year Book may be briefly noted: the increase of tests reviewed from 231 in 1938 Year Book to 503; review of many old tests; the number of reviewers increased from 133 in 1938 Year Book to 250. The get-up of the volume is excellent and the classification of tests has been improved. There cannot be any reasonable complaint about indexing and cross-references. Generally speaking, the Year Book will help test users better than before in selecting between good and bad tests for their special purposes. Further, it will make authors and publishers more careful than before in the matter of new tests.

Prof. Buros writes: "The task of initiating, editing and publishing a year-book which aims to be comprehensive in scope, unbiassed in treatment and frankly critical in attitude is not easy." We agree with him. But he has done it all the same, and so well! I have no hesitation in making the remark that the service that Prof. Buros and his friends have been rendering to the cause of mental measurement is of very great value and we must feel grateful for it. The present volume will prove a very useful book of reference and guidance to test users of all types—teachers, principals, research workers and test technicians. It should find place in every up-to-date library, psychological laboratory, progressive school and training college. We hope that adequate financial aid would be forthcoming not only to keep the Year Book going but also to enable the promoters of the Year Book idea to develop their valuable service along useful directions.

By way of a suggestion it may be pointed out that inasmuch as the value of the Year Book, both as an expert guidance to test users and as a directing influence over construction and publication of tests in future, would depend principally on the quality of the reviews, an effort should be made to study how to secure able, frank and practically useful critical appraisals of the tests in future Year Books to a greater extent than has been achieved in the present work. As one goes through the pages of the book, one notes that the United States of America have received better representation (perhaps mainly for the War) in the lists of tests reviewed and in the lists of reviewers than other countries of the world. As the volume is meant as a book of reference, we hope that this shortcoming will be removed in future, specially when world conditions permit.

H. P. MAITI.

Khilounne—By Dr. Indrasen, New Delhi. Pp. 16.

It is a useful pamphlet in Hindi for parents and would enable them to make a proper selection of toys for their young ones. The author writes very enthusiastically and clearly. He very rightly considers the value of toys mainly from the psychological viewpoint.

H. P. MAITI.

Bachchon ki kuch Samasyaeyn—K. L. Shrinani, Vidya Bhawan, Udaipur, 1942. Pp. 7+301.

Books on child psychology written in Indian languages are very limited in number indeed. Naturally, one would like to extend warm welcome to any sincere effort made in this direction. Mr. K. L. Shrinani's 'Bachchon Ki Kuch Samasyaeyn' (Some Problems of Children) is a very desirable attempt and will certainly be appreciated by the Hindi-knowing public.

Obviously, the intention of the writer was not to compile a text book but to prepare a guide for the parents, teachers and those who are interested in the problems of children. The object of writing being clear to the writer he has got rid of the classical procedure of treating the subject. Each chapter concerns itself with a particular problem which very commonly arises in dealing with children. Though it is particularly meant for the laymen, some of the most recent findings in psychology and psychoanalysis have been introduced into it at proper places, carefully avoiding, at the same time, the creation of any pedantic atmosphere.

The last chapter, 'Education and Society,' reflects the writer's personal but critical views on education today. All the fundamental theories of education have a common background inasmuch as all of them maintain that satisfactory education lies in developing one's individual characteristics in harmony with the social pattern. The reviewer entirely agrees with the author when after surveying the existing social conditions in most of the countries he finds ample justifications for not being optimistic. The mode of our living indicates as if the uncanonical canon of all-for-himself-and-devil-may-take-the-hindmost is the rule and not an exception today. Under such conditions one may begin to feel dubious if the function of education can possibly be fulfilled.

N. MUKERJI.

Psychological Determinants in the Choice of Vocations—By Sarojendranath Ray, M.Sc. Published by the Calcutta University, 1942.

The monograph aims at reaching an answer to the question: "What factors, innate or environmental, determined the choice of vocation of some of the successful men of our country." Success is defined after Earle as 'satisfactory achievement'. The problem is further limited to psychological determinants. The data have been obtained by five sets of questionnaires.

The author finds that roughly 30% of those who finally enter a profession envisage the prospect at school. The ultimate choice is determined by a number of factors such as father's profession, guardian's wish, personal choice, proficiency in scholastic subjects, appeal of certain specific social

and personal goals. Such goals usually comprise desire for position, honour, welfare of the family and its economic need, desire for power and influence and economic return. Most of these goals are then ego-centric.

The author attempts to trace these goals to certain broad motives some of which he calls 'instincts'. Such use of the term, though common, is inadvisable. Popular speech has introduced enough confusion into the term instinct; the psychologist should not be an "accessory after the fact".

The monograph is well written. The author has been able to keep his head above waves of flood of theories that spell obscurantism. I congratulate the young psychologist and hope that the promise shown in the present research will mature into many other contributions in the near future.

N N. SENGUPTA.

NOTES AND COMMENTS

The Psychological world has suffered a great loss by the death of Professor Kurt Koffka on November 22, 1941. Born in Berlin on the 18th March, 1886, he studied philosophy first in Berlin and then in Edinburgh. Finally he took his doctor's degree in 1908 in Berlin under C. Stumpf. For a year or so he worked at Wurzburg as an assistant to Kulpe and Marbe. In 1911 he became a lecturer at Geissen and in 1919 was made an Assistant Professor there. Koffka remained in Germany for eight years after that but inspite of his outstanding achievements and high international reputation he was not given a full professorship as he was an " independent and unprejudiced thinker ". In 1927 he joined the Northampton University in America as a Research Professor for five years but was later made a permanent Professor of the Faculty of that University. He was holding that position when death put an end to a glorious career.

As one of the originators of the Gestalt theory Koffka's name is well known to every student of psychology and philosophy. The birth of the Gestalt theory officially dates from 1912 since in that year appeared papers by Wertheimer, Koffka and Köhler which provided the experimental basis of that theory. It will be of interest to note however that earlier in his doctorate thesis Koffka had discussed the principles underlying the Gestalt standpoint.

In 1921 Koffka's book, *Die Grundlagen der psychischen Entwicklung*, was published and it at once established Koffka's reputation as an original thinker and as a leader of a new fruitful movement in psychology. His book was translated into English in 1925 and very soon also in other languages such as French, Spanish, Russian, Chinese and Japanese. The book was hailed as a landmark in child psychology. (The University of Calcutta as early as 1925 included the English translation of that book, *The Growth of Mind*, in the list of text books for the Post-Graduate students in Psychology.)

As a teacher Koffka was, we learn on the authority of his students, impressive and very attractive. In society he was very popular. Walter Eisen writes: " The musical evenings at Koffka's home were very gladly appreciated by us students, or rather those students who were not simply studying for examinations. It was a meeting place for students, artists and scholars." One of Koffka's outstanding characteristics was his genuine lack of interest in personal recognition.

We mourn the rather untimely death of Professor Koffka.

... ..

We are also very sorry to have to refer to the death of Professor John Alexander McGeech which occurred on March 3, 1942. Born at

Argyle, New York, on October 9, 1897, he received his doctor's degree in 1926, and eventually was appointed Professor of Psychology at the State University of Iowa. He was an editor of the *Psychological Bulletin* and as such was known to the workers in the field of psychology in this country.

Educationists in India have made interesting experiments here and there. They have set out now to co-ordinate and guide educational researches and for that purpose have formed the 'The Indian Educational Research Association.' The association is publishing a journal twice a year called the 'Indian Education,' which has been placed on our exchange list. We cordially welcome the new journal and wish it a long and prosperous career.

Some of our members have suggested certain concrete works which our Association as an organised body should take up for investigation. The Executive Committee appointed a small sub-committee to consider the feasibility of undertaking the suggested concrete works and propose workable plans. The report of the sub-committee will come up for consideration before the Annual General Meeting of the Association to be held in January, 1943. All details regarding the schemes adopted and the plans formulated will be published in the next number of this journal.

Suggestions have been received to take up the following works: (1) Collection of data and statistical information in this country regarding Intelligence quotient, Vocational aptitude, Mental deficiency, Crimes, Suicides, etc. (2) Formation of study circles in different parts of India and organisation of discussions, training courses, popular lectures, etc. (3) Study of certain social customs, class consciousness, welfare problems, etc. (4) Introduction of an uniform course of study in psychology at the different Universities. (5) Writing of books on psychology on a co-operative basis. (6) Inclusion of psychology in the examinations for different services. (7) Help and encouragement to workers studying problems like propaganda, public morale, panic, rumour, parapsychology, educational plans, religions, etc. (8) Co-operation with Civil Defence organisations and other public utility bodies for the application of psychology to war emergency.

It is a truism that psychology can make itself enormously useful to individuals and to society. It is however to be admitted that in India we have not as yet made any well-planned large-scale attempt to utilise the results of psychological researches either for ameliorating the conditions of society or for helping individuals to overcome their internal

conflicts. At every step the individual, be he a householder, parent, guardian, husband, student, manager of a big industry or a mere worker in a factory, has to face problems which he knows not how to deal with. As the economic conditions of the country are becoming more and more critical day by day, accustomed ways of adjustment are proving inadequate to meet the new situation. When the rate of change of outside conditions further accelerates, and it can be presumed that it will do, the normal modes of the individual's behaviour, even allowing for the $\pm \delta$ (the amount of variation) that he is capable of introducing in them, will not enable him to overcome successfully the external onslaughts and internal struggles. A radical alteration in mental outlook and ways of action may be necessary. How many are able to change one's entire outlook at a short notice? And what would be the consequence when many fail? Already statistical figures have been drawing our attention to the increasing percentage of the "socially unadjusted" in our country. Can any one, and above all, the professed psychologists, remain unconcerned at this prospect?

The problem of the individuals adjusting themselves to society is a double-edged one. As the individuals on the one hand have to put forth constantly increasing efforts, the society on the other hand has to lessen the rigours of its demands. Social psychologists, therefore, have fresh problems created for them by the unusual conditions of our present-day society. A campaign for 'Develop More Courage' would be no less important than the 'Grow More Food' propaganda.

Restriction of paper is bound to produce deficiency in mental food. Already books which are the main sources of knowledge and information are fast becoming scarce in the market and when paper too is added to the list of the 'unobtainables' we have to face the prospect of mental starvation. How to prevent the devil from opening his workshop on the grand scale that he foresees?

We congratulate our colleague Mr. K. L. Shrimali on his being put in charge of the newly started Teachers' Training College at Udaipur. Mr. Shrimali will continue to direct also the Vidya Bhavan High School as before.

We offer our congratulations to Mr. D. Ganguly, a member of the Executive Committee of our Association, who has been appointed a special Welfare Officer for the recruits under the Government of India.



